Interreg
EUROPEAN UNION
Danube Transnational Programme
DAPhNE

Port infrastructure & industrial development

D.5.1.1: Status of port infrastructure development along the Danube

Work Package 5

Activity 5.1

PP Responsible: iC

Date: 31/10/2017

Version 1.0 (FINAL REPORT)

Project co-funded by European Union funds (ERDF, IPA)

Interreg
Danube Transnational Programme
DAPhNE

Document History

Version	Date	Authorised
Version 0.1	29/06/2017	iC
Version 0.2	29/09/2017	iC
Version 1.0	31/10/2017	iC

Contributing Authors

Name	Organisation	Email
Saša Jovanović	iC	s.jovanovic@ic-group.org
Werner Auer	EHOÖ	w.auer@ennshafen.at
Tomáš Červeňák	VPAS	tomas.cervenak@vpas.sk
Monika Thury	HFIP	popeiproject@gmail.com
Srđa Lješević	PGA	srdja.ljesevic@aul.gov.rs
Stoyan Hristov	BPICO	s.hristov@bgports.bg
Luminita Meterna	APDM	daphne@apdmgalati.ro
Radu Florescu	MPAC	rflorescu@constantza-port.ro

Table of Contents

Table of Figures

Table of Tables

Executive summary

Inland waterways and maritime transport network consists of two equally important elements: links and nodes. For an efficient and reliable functioning of the transport network both elements must be equally developed and harmonized. This report aims to provide a comprehensive image of the status of the port infrastructure in the Danube area and clarify questions related to the usage, port development and rehabilitation plans and infrastructure gaps. For the purposes of transforming the Danube area ports into efficient and reliable logistics nodes, infrastructure gaps need to be dealt with in a coordinated manner, which needs to be embedded in the resulting common strategy and action plan for port development in the Danube area.

Ports infrastructure is examined through an agreed set of introductory information on port position, ownership, administration and operation, followed by a number of infrastructure assets and elements. The vast majority of ports are publicly owned and privately operated. Private operators in ports are not necessarily companies owned by the private sector, but they can be publicly owned and operating under private company laws. Apart from the port land, the public sector (various governmental tiers – state, region, municipality) also owns the port infrastructure in most of the ports. This corresponds to the commonly accepted view that the port infrastructure is a strategic infrastructure asset, just like highways or railways. This, however, does not represent a barrier for their exploitation by the private sector. Almost all of the analysed ports are governed by a public entity having the role of a port authority which, in most of the cases does not provide port commercial services. Commercial exploitation of ports is entrusted, in most of the cases, to public port operators.

From the point of view of infrastructure assets, an indicator of the port size and its ability to serve its core business – waterside cargo handling (a.k.a. ship-to-shore operations) is the length of operational quays. In this case, ports show considerable differences in quay length, starting from just (currently) 120 meters in the Port of Slavonski Brod on the Sava River (Danube's largest tributary) in Croatia to 8.455 meters in Bratislava. Seaport of Constanta has, logically, the longest quay line of almost 30 kilometres. In port operations technology, vertical quays are often seen as a preferred way of quay wall layout for inland ports, in spite of the higher costs of their construction when compared to the old fashioned sloped (inclined) quay walls. Therefore, a convenient measure of the infrastructure advancement of a port is a share of vertical quay wall in the total quay length. Currently, only 3 ports have 100% of vertical quay length, while only 4 ports have more than 60% of the vertical quay length in their total quay length.

Most of the ports are faced with the problem of the lack of free space for further port development, except the port of Constanta. Available space for further port development stretches from virtually zero hectares in the ports of Vienna, Komarom, Vukovar, Novi Sad, Belgrade and Giurgiu, to maximum 50 ha in Enns and 95 ha in Bratislava.

When an average annual throughput over 10 years of available statistical records (where available) is calculated and compared to the reported capacity, an average utilization of port capacities is obtained. This indicator demonstrates a clear picture of the utilization of the analysed ports. In this view, 5 ports have the capacity utilization is above 50%. This, on the one hand, is positive in terms of business, but on the other hand, may be a signal of either outdated procedures or equipment, or of simply physical limitations of the port. Proper port planning will not allow that the capacity utilization reaches maximum levels as the goods owners will simply move to either another port in the vicinity, or they will change the transport mode, whenever possible, due to the congestion problems that can become inevitable whenever the capacity reaches the levels above 50%.

Detailed statistics for each of the ports demonstrate that mass bulk cargo is still pre-dominant cargo on the Danube. Cargoes that were transported were mostly agri-bulk cargoes, coke, coal, ores, fertilizers, oil and oil derivatives, as well as metal products. Although recorded in some ports as their regular cargo, sand and gravel usually do not need any port facilities to be loaded/unloaded and are very local (transported over relatively short distances), and are therefore not seen as attractive cargo for ports.

Unfortunately, there are no regular container shipping lines on the Danube. Container transport on the Danube is virtually non-existent, in spite of the two noticeable attempts in the past.

The survey of the port development demonstrated that 19 selected ports had a total of 136 projects. The largest number of port projects was recorded in Romania since 6 Romanian ports were included in the analysis, including the seaport of Constanta which has by far the largest number of projects (48), due to its sheer size. In all ports out of the total of 136 projects, 26 projects were already completed, while 39 projects are currently on-going (status September 2017 and 73 project are planned as of the end of 2017 onwards. Costs of completed projects in all ports was 302 million Euro, while the current investments in on-going projects are almost double and reached a level of 532 million Euro. Planned port infrastructure investments are ten times higher than the current investments, but financing sources for most of these projects are yet to be secured. Regardless of that, the general conclusion is that the investments in ports are on the rise.

When project costs are broken down to individual ports, it can be noted that the majority of port projects are well below 100 million Euro, with the exception of the projects in the ports of Constanta, which has the highest total project costs of 4.8 billion Euro, while only six ports which have project costs higher than 100 million Euro.

In terms of the scope of work of port projects, the largest share of projects belongs to rehabilitation and upgrade works (40 projects) and construction of new infrastructure assets (58 projects). Only 22 projects are reported to cover only studies, while 11 projects contain both studies and works, where studies are referred to as feasibility studies, master plans and designs studies, all leading towards the concrete physical works on port infrastructure.

Most of the projects deal with the extension of the waterside capacity, which is a positive sign from the point of view of increase of inland waterways transportation. Total of 24 projects deal with improvement of road connection or internal roads in ports (11 projects) and improvement of rail connection or internal rail capacities within ports (13 projects). What is especially encouraging is the fact that ports are keeping the pace with other transport nodes and modes in terms of combating greenhouse gasses (GHG) emissions. In this view, 7 port development projects are dealing with construction of alternative clean fuels facilities, while 8 projects involve greening of port operations through incorporation of electric-driven equipment, solar power, LNG powered machinery, waste management, etc.

It needs to be noted that the largest number of projects are either on-going projects or are planned within the current decade. Unfortunately, a relatively large number of projects have the start and end date unknown, meaning that the financing of those projects have not been secured until the moment of writing this report, or that the projects are not mature enough to have the financing figures ready at this moment.

When infrastructure gaps are concerned, it can be safely concluded that many ports in the Danube area are focusing their development towards the construction and provision of intermodal facilities. However, this may be seen as a double-edged sword. Taking into account that intermodal transportation (e.g. container transportation) on the Danube is virtually inexistent, except for the containers in the seaport of Constanta which are being exported and imported via maritime transport, and sporadic transport of empty containers on the upper Danube, it needs to be noted that inland ports are increasingly using their port areas for bi-modal intermodal transport, involving only or mostly rail and road transport.

It needs to be emphasized that the number one gap for ports is still the lack of sufficient quay space, or the quay length. A total of 16 (out of 19) ports have identified the need to extend the quay length, that is, their waterside capacities. The importance of this lays in the fact that ports need, on the one hand, to respond to the growing demand for vessel handling facilities and, on the other hand, to offer additional quay capacities in order to prevent vessel operators to divert to other ports in case of continuous port congestion problems, or to keep the cargo receivers or shippers to use their port instead of choosing another port or even another transport mode if even the seasonal effects cause repetitive congestion and delays.

Fifteen ports identified the need to improve or extend their internal railway capacities - a logical step since many ports strive to provide direct ship-to-wagon transshipment whenever possible, due to easier organisation of on-haulage or pre-haulage of cargoes and faster cargo collection or distribution.

Rail connections need to be improved in 15 ports while internal roads need to be improved in 14 ports. Improvement of internal roads is needed for the daily operations in ports in situations when huge number of trucks are carrying port inbound and outbound cargoes and when internal port vehicles and handling equipment handle the cargo between the quay area and base or transit storage areas and the port gate. Rail connections (construction or improvement) to hinterland is of crucial importance since the ports need efficient and reliable connection to their hinterland and the rest of the transport network feeding the ports with their cargoes.

Due to the increase of cargo throughput and expansion of value added services for cargoes handled in ports, ten ports have expressed the need for an extension of cargo handling areas, usually located just behind the quay wall or between the quay wall and storage areas.

Almost half of the analysed ports identified the need for capital and/or specialized transshipment and handling equipment including heavy lift capacities. The reason for this is of dual nature. First, a number of ports have either outdated capital equipment (all sorts of loading/unloading cranes and similar equipment) or such equipment is nearing the end of its life cycle, making such ports lag behind more developed ports and thus jeopardizing the efficiency and reliability of entire supply chains along the given routes. Logically, the need for replacement of such equipment, which is very expensive, is on the rise. Second, ports are looking towards the new markets, such as the markets of heavy and out-of-gauge cargoes, which represent very convenient cargoes for inland waterway transportation since no special licenses or permissions or special vehicles are needed for the transport of such cargoes on inland waterways. Since not many ports possess equipment for handling of such cargoes, the orientation towards the market of high and out-of-gauge cargoes caused the need for such equipment, reflecting the pro-active attitude of ports towards new markets.

Last but not least, an encouraging number of ports are showing their awareness of the need to “green” the ports and port operations. Five ports identified the need for structures needed for collection and treatment of precipitation water (rain, snow, etc.), while six ports have expressed the need for alternative clean fuels (LNG) bunkering facilities (apart from the existing LNG fuelling facilities in Ruse and Enns), even though no LNG fuelled vessels currently operate on the Danube and its tributaries. Finally, four ports identified the need for alternative fuelled (LNG, electric, etc.) handling equipment such as cranes, reach-stackers, forklifts, straddle carriers, etc.

1 Introduction

Port development is seen as a catalyst to stimulate economic activity and create employment. In Europe, port developments relate mainly to building new terminals and upgrading the super- & infra-structure within existing ports rather than developing new greenfield sites.

As such, much of the reform process has more to do with the organization and operational aspects of ports. This WP will assess the situation along the Danube and will focus on 3 pillars that contribute to transforming ports into key-hubs of the European transport network and help trigger the reform process: infrastructure investments, funding sources for stimulating investments and innovation.

The goal is to provide a comprehensive package of the issues to be approached jointly in order to help compensate the unbalanced development level between the Upper Danube ports and the other river sections.

For this, four activities have been planned. In Activity 5.1 the focus will be on means of stimulating the upgrade of the port infrastructure & industrial development. This activity corresponds to the 1st pillar. The second activity will target the issue of financing port investments, as experienced via public-private partnerships (2nd pillar). In regards to the 3rd pillar dealing with innovation two activities have been planned.

Activity 5.2 will focus on public-private partnerships (PPP) for port investments which have become a very interesting and convenient development option in the last 25 years. The most common form of PPP is the operation of a concession agreement.

In Activity 5.3 the consortium will focus on the simplification of the work flow within the ports with the help of a modular port community system.

A pilot implementation of this IT system will be planned & implemented in 3 ports along the Danube. Other Danube ports will be able to apply this system by adapting to their own needs the IT model architecture developed by the DAPhNE PPs.

In Activity 5.4 innovative markets will be investigated in order to identify potential types of cargo that could be transported on the Danube and the special conditions that the ports have to comply with to accommodate these future changes. The findings will be reflected in the case studies for new markets - circular economy.

1.1 Objectives of the activity

The objective of Activity 5.1 is to provide a comprehensive image of the state of the port infrastructure along the Danube and clarify questions related to ownership, rehabilitation plans, missing infrastructure, etc. These facts will be incorporated in an overall Report on the status of the port infrastructure development.

This document will also be used as a tool for the update and validation of the Rhine-Danube Work Plan and will thus be further capitalized on by other entities at regional & European level.

In order to transform Danube ports into logistics hubs, the infrastructure gaps need to be dealt with in a coordinated manner. The level of intermodal facilities in ports is varying and, generally, declines in the "down the river" direction, with a noticeable need for additional provision of such facilities in determined ports, as specified in the EU Rhine-Danube Work Plan. Nevertheless, the missing facilities have also to be linked to relevant industrial activities in the area, to stable cargo flows and reliable funding sources.

2 Scope of the report

This report will encompass four major issues important for the assessment of current status and development plans for port infrastructure. Due to the huge number of Danube ports and infrastructure parameters needed for infrastructure analysis the study team agreed to provide high-quality analysis of 19 selected ports along the Danube and its tributaries, including the most important “gate” for the Danube ports – the seaport of Constanta.

Following ports are selected for detailed analysis in this report:

- Austria: Enns and Vienna
- Slovakia: Bratislava and Komarno
- Hungary: Budapest and Komarom
- Croatia: Vukovar and Slavonski Brod
- Serbia: Belgrade and Novi Sad
- Bulgaria: Lom, Ruse and Vidin
- Romania: Drobeta Turnu Severin, Giurgiu, Galati, Braila, Tulcea and Constanta.

2.1 General data and infrastructure assets

Following a brief presentation of the basic info on the port and its management, a detailed cross-cut of the current infrastructure of the selected Danube ports. Due to the scope and volume of the sets of general data and infrastructure indicators, a list of parameters, detailed overview, accompanied by necessary definition, is given in **Chapter 3** of this report, while each selected port will present the general data and infrastructure assets in **Chapter 4**. Apart from these datasets, Chapter 4 also contains a brief analysis of the potential users in each port as well as basic information on the planned industrial developments in the port hinterland.

2.2 Cargo statistics 2007-2016

Project partners have agreed to provide cargo statistics for the selected 19 ports. Such statistics is needed to obtain an overview of the port throughput in the last years and to provide a basis for realistic assessment of the ports’ needs in the forthcoming years. Statistic data will not be presented in a separate chapter, but will form a part of **Chapter 4**, where statistics will be presented within the assessment of status quo of each of the 19 selected ports.

In order to provide a harmonized statistical data records, the Activity leader and project partners agreed to present that statistics according to the NST 2007 Classification[1], as used by EUROSTAT.

[1] For more info please see:
http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl=LST_NOM_DTL&StrNom=NST_2007&StrLanguageCode=EN&IntPcKey=&StrLayoutCode=HIERARCHIC

Interreg Danube Transnational Programme DAPhNE

Table 1: Cargo classification according to NST 2007 Classification

NST Code	Type of goods
01	**Products of agriculture, hunting, and forestry; fish and other fishing products**
1.1	Cereals
1.2	Potatoes
1.3	Sugar beet
1.4	Other fresh fruit and vegetables
1.5	Products of forestry and logging
1.6	Live plants and flowers
1.7	Other substances of vegetable origin
1.8	Live animals
1.9	Raw milk from bovine cattle, sheep and goats
01.A	Other raw materials of animal origin
01.B	Fish and other fishing products
02	**Coal and lignite; crude petroleum and natural gas**
2.1	Coal and lignite
2.2	Crude petroleum
2.3	Natural gas
03	**Metal ores and other mining and quarrying products; peat; uranium and thorium**
3.1	Iron ores
3.2	Non ferrous metal ores (except uranium and thorium ores)
3.3	Chemical and (natural) fertilizer minerals
3.4	Salt
3.5	Stone, sand, gravel, clay, peat and other mining and quarrying products n.e.c.
3.6	Uranium and thorium ores
04	**Food products, beverages and tobacco**
4.1	Meat, raw hides and skins and meat products
4.2	Fish and fish products, processed and preserved
4.3	Fruit and vegetables, processed and preserved
4.4	Animal and vegetable oils and fats
4.5	Dairy products and ice cream
4.6	Grain mill products, starches, starch products and prepared animal feeds
4.7	Beverages
4.8	Other food products n.e.c. and tobacco products (except in parcel service or grouped)
4.9	Various food products and tobacco products in parcel service or grouped
05	**Textiles and textile products; leather and leather products**
5.1	Textiles
5.2	Wearing apparel and articles of fur
5.3	Leather and leather products
06	**Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;**
6.1	Products of wood and cork (except furniture)
6.2	Pulp, paper and paper products
6.3	Printed matter and recorded media
7	**Coke and refined petroleum products**
7.1	Coke oven products; briquettes, ovoids and similar solid fuels
7.2	Liquid refined petroleum products

NST Code	Type of goods
7.3	Gaseous, liquefied or compressed petroleum products
7.4	Solid or waxy refined petroleum products
8	**Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel**
8.1	Basic mineral chemical products
8.2	Basic organic chemical products
8.3	Nitrogen compounds and fertilizers (except natural fertilizers)
8.4	Basic plastics and synthetic rubber in primary forms
8.5	Pharmaceuticals and parachemicals including pesticides and other agro-chemical products
8.6	Rubber or plastic products
8.7	Nuclear fuel
09	**Other non metallic mineral products**
9.1	Glass and glass products, ceramic and porcelain products
9.2	Cement, lime and plaster
9.3	Other construction materials, manufactures
10	**Basic metals; fabricated metal products, except machinery and equipment**
10.1	Basic iron and steel and ferro-alloys and products of the first processing of iron and steel (except tubes)
10.2	Non-ferrous metals and products thereof
10.3	Tubes, pipes, hollow profiles and related fittings
10.4	Structural metal products
10.5	Boilers, hardware, weapons and other fabricated metal products
11	**Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks**
11.1	Agricultural and forestry machinery
11.2	Domestic appliances n.e.c. (White goods)
11.3	Office machinery and computers
11.4	Electric machinery and apparatus n.e.c.
11.5	Electronic components and emission and transmission appliances
11.6	Television and radio receivers; sound or video recording or reproducing apparatus and associated goods (Brown goods)
11.7	Medical, precision and optical instruments, watches and clocks
11.8	Other machines, machine tools and parts
12	**Transport equipment**
12.1	Automobile industry products
12.2	Other transport equipment
13	**Furniture; other manufactured goods n.e.c.**
13.1	Furniture
13.2	Other manufactured goods
14	**Secondary raw materials; municipal wastes and other wastes**
14.1	Household and municipal waste
14.2	Other waste and secondary raw materials
15	**Mail, parcels**
15.1	Mail

NST Code	Type of goods
15.2	Parcels, small packages
16	**Equipment and material utilized in the transport of goods**
16.1	Containers and swap bodies in service, empty
16.2	Pallets and other packaging in service, empty
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non-market goods n.e.c.**
17.1	Household removal
17.2	Baggage and articles accompanying travellers
17.3	Vehicles for repair
17.4	Plant equipment, scaffolding
17.5	Other non-market goods n.e.c.
18	**Grouped goods: a mixture of types of goods which are transported together**
18.1	Grouped goods
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**
19.1	Unidentifiable goods in containers or swap bodies
19.2	Other unidentifiable goods
20	**Other goods n.e.c.**
20.1	Other goods not elsewhere classified

2.3 Port infrastructure development projects

Each port provided an agreed set of data on its infrastructure development projects completed in the last 5 years (since 2012), currently on-going projects and those planned to be completed until 2030. Such data contain information on the name of the project, short description of the project, as well as the cost and planned duration (start and end year) of each of the projects. Data will be presented for each port in **Chapter 5**. Combined with the current status of port infrastructure, as well as with the recorded and/or planned industrial development described in **Chapter 4**, these inputs will be used for the infrastructure gap analysis in **Chapter 6**.

2.4 Port infrastructure gap analysis

Based on the inputs from the assessment of current status of the port infrastructure, accompanied by info on planned industrial developments on the one hand, and based on the on-going and planned port infrastructure projects on the other hand, port infrastructure gap analysis is performed in **Chapter 6**.

2.5 Overall analysis of Danube ports infrastructure

On the basis of inputs of all previous chapters, an overall analysis of ports infrastructure is elaborated in **Chapter 7**. First, a common overlook is given in terms of benchmarking of several indicators related to ownership, administration, operations and infrastructure. Ports are compared against their size, quay length, availability of development space, available capacity and averaged capacity utilization rate. Next, a short overview of statistical records showing the ups and downs of cargo throughput is given, immediately followed by a detailed analysis of port development projects. The analysis is concluded with the infrastructure gaps matrix, representing a self-assessment of ports needs in the forthcoming period.

3 Elements of infrastructure assessment

3.1 General port data

Prior to the assessment of current infrastructure facilities in selected ports along the Danube and its tributaries, with an addition of the seaport of Constanta as the maritime gate for the Danube ports, a set of general port data is examined for all selected ports.

Set of general port data is established as follows:

Port land owner

Depending on the port ownership legal setup and port governance (port administration, port management) systems in each riparian country, the ownership of the land within the port area may be of the state, region/province, municipality, private or of other entities. The port land owner (or the landlord) is usually the regulator of the exploitation of the port and regulates the conditions and obligations related to the governance (administration) and/or use of the port and its facilities. In this view, each of the selected ports is examined in the view of the land ownership.

Port infrastructure owner

For the purposes of the definition simplicity, it is adopted that the port infrastructure involves all port related infrastructure in the ground level, such as, quay walls, bank protection, port basins, berths, anchorages and/or mooring places, waiting areas, crane tracks, rail infrastructure and other publicly used infrastructure assets. Ports that are selected for this report are therefore examined from the point of view of infrastructure ownership. Such ownership is considered important as the owner of port infrastructure assets sets the rules of the type and scope of use of port infrastructure. As in the previous paragraph, owners of the port infrastructure can be the state, region/province, municipality or other entities (port authority, public companies for infrastructure construction and management, etc.) to which the ownership rights are given or transferred, by the supreme regulatory authority.

Port authority (port governance, port administration)

Each port will elaborate on a body/entity (publicly owned company, governmental institution, organisation or similar) that acts as a port authority, a “roof“ organisation for all port locations at a given place (city, municipality, region, etc.). Port authority may sometimes be the same legal entity as port operator, if the administrative functions of port governance (administration/management) are not organisationally separated from commercial activities of port operations / port exploitation.

Port operator(s)

Port operators will be identified in all selected ports along the Danube and their ownership structure will be examined. Port operators nowadays are usually independent companies that may be public, private or even of mixed ownership. In a number of cases in Danube ports, port operators are the same as port authorities, organised as commercial entities with both governance and operating responsibilities.

Port authority name

Legal name of a body or entity having port authority functions will be identified for all selected ports along the Danube.

Port authority separated from port operator(s)

An examination of separation of governance and operating functions will be performed for all selected ports. Each port will present if these two functions are practiced within the same body/entity or if these two functions are organisationally and legally separated into two or more legal entities.

Number of operators (concessionaires, lessors)

Depending on the size and type of the port, each port can have one or more operators. Number of different entities (public and/or private) operating a port (or its individual terminals) under any legal form (concession, lease contract, operating contract, etc.) will be identified for each selected port.

3.2 Infrastructure assets

Following infrastructure assets are examined in all selected ports so as to obtain a detailed overview of the current status of existing infrastructure and their capacities in ports.

Total port area

Each port will present the surface (in hectares) of the entire port area under jurisdiction/responsibility of an entity acting as a port authority.

Free space for development within the port area

Surface of any land slots within the area under jurisdiction/responsibility of a port (or port authority), which is available for development under any form of use (own development, concessions, lease contracts, etc.).

Open shore port, Basin type port, Number of basins

These parameters are used to describe whether a port is physically located on an open shore, or it is located in an excavated, regulated port basin. A number of basins in each port will also be given.

Maximum draught - natural or dredged

Parameter used to describe the maximum draft of a vessel that can enter a port. Not to be confused with a depth of a port.

Cargo handling capacity, Throughput capacity for containers

Maximum cargo handling capacity of all terminals within a port area within a given port service pattern or maximum quantity of cargo that can be un/loaded with the existing equipment. Alternative definition: technical capacity. Usually measured in tons/year (day, month, hour) or in TEU (Twenty-foot Equivalent Unit)

Port service time (hours per week)

Not literally an "infrastructure asset", but a useful indicator of the port performance and current operational status. Defined as a number of hours when the port is open in a week. Usually depends on the number of shifts. Ports working 24 hrs/day and 7 days a week have a maximum number of working hours: 24 x 7 = 168 hours.

Total number of terminals

For the purposes of definition simplicity, it is taken that a terminal is a specific physical, technological, organisational and/or operational area where a certain cargo is handled. Larger ports can have multiple terminals for different types of cargo, whereas smaller ports usually have at least one terminal where all cargo is handled with different type of un/loading facilities and equipment. Each port will present how many terminals exist in their port area.

Number of bulk terminals, Number of break-bulk (general cargo) terminals

This parameter describes simply a number of port terminals where specific bulk cargo is handles. Similarly, the second parameter demonstrates a number of break-bulk (i.e. general cargo) terminals where only this type of cargo is handled.

Number of oil/chemical/gas terminals

This indicator shows a number of terminals in a port where different types of oil, chemical or gaseous cargoes are handled. These types of terminals are also known as liquid bulk terminals.

Number of Ro-Ro terminals, Number of Ro-Ro ramps

The first parameter, number of Ro-Ro terminals, indicates a number of terminals where only wheeled cargo is handled, loaded/unloaded on/from a vessel horizontally, over a vessel ramp, using its own wheels or wheels given to it (cargoes on so called "mafis", where any break-bulk cargo is loaded onto a trailer which is used only, or mostly, on Ro-Ro vessels, thus "obtaining the wheels"). The second parameter indicates a number of shore Ro-Ro ramps where wheeled cargo can be loaded/unloaded horizontally. Usually, a Ro-Ro terminal has at least one Ro-Ro ramp, but Ro-Ro ramps may as well exist on any part of the quay, thus enabling loading/unloading of Ro-Ro cargoes without existing of a specific Ro-Ro terminal. Ro-Ro ramps outside specific Ro-Ro terminals are usually seen at multi-purpose or general cargo terminals.

Number of quay-side container terminals with no rail access

This parameter is defined as a number of container terminals with access to water (via quay) where only ship to truck (and vice-versa) transhipment is possible.

Number of rail-road bi-modal terminals within the port area

Defined as a number of rail-road (bi-modal) container terminals within a port area where such terminals have no direct access to water (quay) and where no direct ship-to-shore transhipment can be performed.

Number of tri-modal terminals (with water, rail and road access)

Defined as a number of container terminals where all types of transhipment can be performed directly (ship-to-truck, ship-to-wagon, wagon-to-truck and vice-versa)

Number of multipurpose terminals

Number of terminals where different cargo (or all types of cargo handled in a given port) can be transhipped.

Number of other (specialized) terminals

Number of other terminals where specific cargo (not listed earlier) can be handled (e.g. terminals where heavy cargo is transhipped exclusively, or terminals where only bulk cement is un/loaded to vessels using, say, pneumatic (un)loaders or similar).

Heavy lift and out-of-gauge handling capacity

Under this indicator a port's ability to load/unload (from vessels) heavy or out-of-gauge cargo, not on a specific terminal but at one of the existing terminals usually used for other types of cargo, will be assessed.

Ability to handle full block train along the quay

This parameter indicates if a port can handle a full block train along the quay (allowing for a direct ship-to-wagon (or vice-versa) transhipment) without breaking a train composition. Usual length of a block-trains in Europe is between 400 and 740 meters. Therefore, if a straight quay length is shorter than a block-train than a port does not have this ability.

Ability to handle full block train in the port area

This parameter indicates if a port can handle full block-trains in other areas of a port, without direct access to water (quay).

Transhipment equipment for intermodal transport

This indicates if containers and other swap bodies be transhipped and handled in a port where no specific intermodal terminals exist.

Total quay length (vertical + sloped)

Total length of all operational quays in a port, combining the length of vertical and sloped quay walls.

Vertical quay length

Total length of all operational vertical quays in a port. Vertical quays are usually taken as an indicator of efficient infrastructure, as they enable vessels to berth and be loaded/unloaded at all navigable water levels. In addition, they enable cranes to reach the cargo easier than in the case of sloped quays at low water levels, when vessels are berthed further away from the vertical axis of a crane. Although more expensive to build, these quays facilitate the efficiency of port operations.

Sloped quay length

Total length of all operational sloped quays in a port. Although cheaper and easier to build, sloped quay walls are less efficient than vertical quays. This is mainly because of the fact that vessels berthed alongside the quay move away from the vertical axis of the quay cranes when the water levels drop down. In this way, the crane needs more time to reach the vessel when both loading and unloading. Even though still existing, sloped quays are becoming relics of the past.

Undeveloped quay length

This parameter indicates the length of the shore (river bank), natural or excavated, which is planned and/or suitable for construction of additional quays in case of the need for port extension and development. This is sometimes done when the port basins are excavated, in such way that one or two sides of the basin are developed and constructed, while the remaining overall length of the basin is left without any quay wall constructed so as to facilitate further expansion of the port when needed.

Max number of vessels handled at the same time

Indicates a maximum number of vessels/barges handled at the same time in a port, when all operational berths are occupied with vessels loading/unloading their cargo. In some ports it is possible that two vessels or barges are berthed at a single berth, in such way that a second vessel or barge is berthed alongside the first vessel or barge which itself is berthed normally at the berth, alongside the quay. In ports where such practice is allowed, this will be especially emphasized so as not to create any doubts related to this indicator.

Max capacity of anchorage or waiting area for barges

Number of vessels that can be anchored off shore (off the river bank) or fasten alongside in areas designated specifically for vessels waiting for loading/unloading (or further orders) in a port.

Mooring/Anchorage area surface capacity

Indicator similar to the previous one, only quantified in square meters.

Mooring/Anchorage for dangerous cargo vessels

This parameter indicates the possibility of vessels carrying dangerous cargo to use the same anchorage or mooring places where other vessels are anchored/moored. In case the general anchorage or mooring places do not allow mooring or anchoring of such vessels, and if a port has special anchorages for this type of vessels, this will be explained under this parameter.

Waterway connection (CEMT class, for seaports only)

Parameter relevant only for seaports (Constanta in this case). Demonstrates a CEMT class of the inland waterway connection to the seaport, as an indicator of the capacity of inland waterway vessels that can enter the seaport.

Number of road entrances (road gates) to port

Number of official road entrances (road gates) to the port area under jurisdiction or responsibility of a port authority or port operator. Smaller ports tend to have a single road entrance, while larger ports usually have multiple road gates, allowing vehicle access from different sides and different hinterland connections.

Number of road lanes from/to each road entrance

Number of all road lanes at all road gates (road entrances). Here, a lane is defined as a section of a road where one-way traffic is possible. Typical two-way road has two lanes, one for each way, as an example. If, for example, a port has two road entrances (say, one entrance on the east and another one on the south side), one with four lanes road and another with two-lanes road, the total number of road lanes is 4+2=6.

Number of rail entrances (rail gates) to port
Number of official rail entrances (rail gates) to the port area under jurisdiction/responsibility of a port authority or port operator. Smaller ports tend to have a single rail entrance, while larger ports usually have multiple rail entrances, allowing train access from different sides and different railway lines in the hinterland.

Number of rail tracks from/to each rail entrance

Number of all rail tracks used to enter a port. For example, if a port has two railway entrances, one with a double rail track and another with a single rail track, the total number of rail tracks is 2+1=3.

Length of rail tracks along the quay walls

Length of railway tracks along operational (vertical and/or sloped) quays allowing for a direct transhipment from ship to wagon and vice-versa.

Total length of rail tracks within the port area

Length of all railway tracks located within the port area (alongside the quay and elsewhere in the port area). Certain ports have a shunting yard within their territories. Such cases shall be specifically emphasized.

Storage capacity

Indicator of an overall storage capacity in a port. It encompasses surface capacity of all storage areas, open and covered, in square meters.

Storage capacity for liquid cargos

Storage capacity of all liquid cargo tanks, in cubic meters (liquified gasses included).

Storage capacity for containers

Storage capacity for containers, in TEU.

Storage capacity for Ro-Ro cargo

Storage capacity for wheeled cargo on Ro-Ro terminals, expressed in CEU – **C**ar **E**quivalent **U**nit. CEU (according to CEU RT43 standard) is equivalent to 4125 mm x 1550 mm x 1400 mm space needed to store 1 CEU. Ground space required for CEU RT43 is approximately 6.4 m2 and the ground slot for the necessary distance between the cars is 7.4 m2. Alternatively, if this capacity cannot be expressed in CEU, then the capacity shall be expressed in number of average vehicles or in simple surface in square meters (m2).

Bunkering facilities within the port area

Indicates the presence of bunkering facilities for vessel fuel.

Type of bunkering facility

Indicates the type of bunkering facility: terminal, tank, mobile container, bunker vessel/barge, other.

Availability of clean fuels (LNG, etc.)

Indicates the existence or construction plans (until 2030) of LNG bunkering facilities for the vessels using LNG (or other clean fuels, as per Directive 2014/94/EU).

Shore-side power supply for vessels

Indicates if a port provides connections for the supply of electricity for vessels berthed (loading, unloading or waiting) in the port.

Waste reception facilities

This parameter indicates if a port has any waste reception facilities of any kind. Such facilities can be in a form of dedicated terminal or berthing area where waste can be delivered on shore, or a dedicated barge collecting the waste from vessels, etc. In the simplest case, the ship waste can be delivered on shore at the berth where the vessel is loading/unloading, before or after the loading/unloading operations.

Used oil collection facilities

Indicates if a port has any facilities for collection of oily wastes, oily waters, sludge, bilge waters, etc.

Surface pavement & drainage

Indicates if construction standards or legal requirements require any specific construction in the pavement for drainage or rain water, sewer or similar.

Precipitation water pre-treatment for port area

Indicates if pre-pre-treatment of precipitation water, along with adequate facilities, is required in a port.

Other special eco-friendly equipment

Depending on the legal requirements in different ports, this parameter indicates existence of any eco-friendly equipment beyond obligatory legal requirements (if any). Electric cranes, loaders, or any other equipment used in daily port operation.

4 Port status quo assessment

4.1 Port of Enns

4.1.1 Position

Ennshafen Port is located on river km 2112 in the mouth of river Enns to the Danube at the border between the federal states of Upper Austria and Lower Austria. The port in total is the largest connected industrial area on the upper Danube, it is a combination of business park areals and port areas in close connection.

The Ennshafen port offers optimal trimodal transportation logistics for export and connects the entire region with international transportation network. Roundabout 55 companies with together ca. 2300 employees represent the whole conglomerate at present.

Ennshafen port is one of two TEN-T-core ports (Rhine-Danube corridor waterway) in Austria.

4.1.2 Ownership, administration (governance) and operation

Ennshafen OÖ GmbH – a company owned by the federal district of Upper Austria - is the owner of the port and do all the administration of the port; Ennshafen port has the PPP-principle as a core part of his strategy, therefore it only builds the basic infrastructure, the suprastructure is invested by private companies, who have got special contracts with EHOÖ (licence contracts and shipment contracts); as well the core parts of the port (quays) are part of a greater mixed area, were a lot of other private companies are owners of ground, buildings and facilities; so it is difficult to find exact battery limits between "port area" and "additional private area" and to get statistic figures, because sometimes a "working area" is a mixture between licence area and own area of a partner company.

Even in Lower Austria the port company Ennshafen NÖ GmbH is owned by the federal district and has got a quite similar structure like in Upper Austria.

4.1.3 Infrastructure assessment

Layout of the Port of Enns is given in the following picture.

Interreg
Danube Transnational Programme
DAPhNE

Figure 1: Layout of the Port of Enns

(Source: EHOÖ)

Port Area: total 352 ha; 110 ha are owned by the port authorities (Ennshafen OÖ GmbH und Ennshafen NÖ GmbH) and 242 ha are owned by other private companies; actual in total about 50 ha are not covered with assets or other investments

The port has got 2 basins and several quays along the river side (Enns); port service time (waterside) is the whole week (7/24 – 168 h/w); the several transhipment stations and service providers have got on time systems due to market efforts.

Figure 2: View of the Port of Enns

(Source: EHOÖ)

Cargo handling capacity: no exact maximum capacity figures are available, but the overall capacity is very much higher than 1 mio t/a (up to now no capacity limits has been reached). The container terminal was doubled in the years 2015 and 2016 and has got now a total capacity of about 400000 TEU/a with 3 gantry cranes (trimodal).

Total number of all waterside terminals are 7 with most of them could be used for different kinds of cargo. Heavy lift and out-of-gauge handling capacity is possible and processed on a project basis, ability to handle full block trains is possible on several lines within the port.

The total length of vertical quays is 3850 m, additionally the port area has got 1900 m of undeveloped quay ("Warteländen"). The maximum number of vessels which can be processed at the same time on the quays is 16, while maximum 34 barges can be processed in the waiting areas / undeveloped quays. Mooring area is 42000 m2.

The whole port area has got 6 road entrances, each with double lines and two main rail entrances access the total area from two different sides. Within the area there is a wide system of internal rail network with many different users and owners (in total about 17 km rail tracks).

Because of the great number of different private owners and service providers actually no exact figures of storage capacity (in m2) are available; but due to the great area of the port (in total 352 ha) much storage area with different dedication is available (from wood to containers to bulk). Special storage capacity for liquid cargo is available with 3000 m2 for LPG and 6000 m3 for biodiesel and bio-oils and another 600 units for cars (equivalent) near the RO-RO ramp.

Special utilities are available for bunkering by vessel/barge, a tank stop for trucks for LNG (at the moment for ships in preparation), shore side power supply and waste reception.

Due to the fact that the total port area is a mixture between area of the port company (= Ennshafen OÖ+NÖ) and private companies some KPIs in the infrastructure asset list are problematic by comparing it to other ports; especially the following parameters need additional special explanation:

- Port land owner: as mentioned above there are many owners in Ennshafen port; the core areas (waterside) are owned by the port company (public owned company), but due to history (in former times a great chemical industry park was started but afterwards sold) a great PPP-complex was established
- Port authority name: 2 public authorities because the river Enns is the border between Upper Austria and Lower Austria (Ennshafen OÖ GmbH und Ennshafen NÖ GmbH)
- Port operators: port authority invests all the infrastructure and private owned companies have special license agreements for qua usage and (sometimes) for land lease with the port authority and invest the suprastructure (in some cases they are owner of the land close behind the quay)
- Total port area: 110 ha in the ownership of the port authority and 242 ha in private ownership
- Free space of about 50 ha: this is a rough figure of space which is not fully covered with investments; this does not mean that space can be bought; a lot of strategic plans exist of the different owners for investing in the near or farer future;
- Basins: 2 special basins, but most of the port business is done on the riverside (Enns)
- Maximum draught: the figure of 2,7 m everywhere in the port has to be fulfilled; there are a lot of spaces with more depth
- Cargo handling capacity: the figure cannot be reported at the moment – figures are not available – due to the great number of private owned equipment
- Quay length: most of the quays are concrete walls, but additionally some lengths are constructed as platforms (dalben+steel platform); the figures contain both types

- Uncovered quay length: these are the so called “Warteländen / “waiting berths””, which are dedicated by authority permission (on both banks of the river Enns) before the quay zone
- Maximum number of vessels: calculated by 110 m vessels
- Number of road entrances: 6 roads; but definition problematic because of the special layout of our port (mixed areas of public and private sections)
- Total length of rail tracks: only the public part; additionally, there are some elder lines privately owned in some spaces (about 1000 m);
- Number of rail entrances (rail gates) to port: at the moment each part has got only one entrance; one of the sides faces some capacity problems;
- Storage capacity: figure is not available at the moment due to the mixture between private and public assets and investments (infrastructure and suprastructure)

4.1.4 Special infrastructure regarding surface pavement & drainage of rain water

Surface pavement & drainage and precipitation water pre-treatment: the port activities and industrial parts were started 40 years ago; due to the mixture between port and private area all the utilities concerning drainage are a combined system; the situation is not state of the art according to strict Austrian (and even German) laws and a lot of improvement projects are necessary by force of the authorities and due to economic reasons (general maintenance of the areas, sometimes divestment of old very huge dimension, bring to a modern standard for new shipment equipment, …)

Special eco-friendly equipment: a lot of devices have been built in Enns due to special problems or authority papers and neighbourhood problems (e.g. installed oil barrier for a port basin; noise barrier along the railway line, …).

4.1.5 Hinterland connections (road, rail and IWW)

Ennshafen Port is located at the heart of Europe and offers everything that is necessary for modern logistics. It is situated on the main arteries of international transportation – on the Rhine-Main-Danube waterway and the north-south railway link from the Baltic Sea to the Adriatic Sea. The Ennshafen port is excellently linked with the most important seaports and with the A1 west expressway (Wien-St.Pölten-Linz-Salzburg) and has close connection to the A9 (Graz-Wels-Passau), the B1 federal highway (Wien-Amstetten-Linz-Salzburg) and the connection to the B309 (Enns-Steyr federal highway), it has outstanding access to the international road network. The railway connections are directly derived from one of the most important Austrian lines – the West Railway (both normal line and high speed line).

Figure 3: Hinterland connections of the Port of Enns

(Source: EHOÖ)

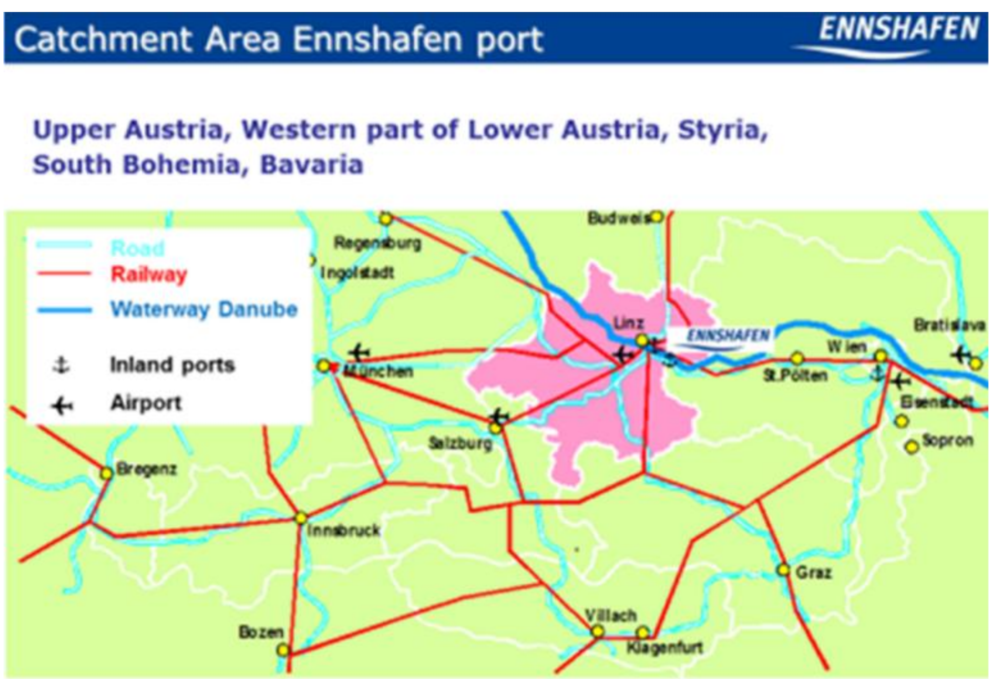

Figure 4: Connections to the wider catchment area of the Port of Enns

(Source: EHOÖ)

4.1.6 Hinterland (economic situation in the port's hinterland)

Upper Austria and the relevant Part of Lower Austria are the most famous industrial developed areas of Austria responsible for a considerable amount of Austrians export volume. With more than 3,5 million square meters of space at the border between the federal states of Upper Austria and Lower Austria, the Ennshafen port is the largest connected industrial area on the upper Danube. There is valuable vacant property with optimal infrastructure available within the port area including the two business parks Enns and Ennsdorf. In the first view within the Ennshafen (port & business parks) about 50 companies are settled with more than 2000 employees.

For example, the following picture gives an overview about hotspots of industrial activity in the surroundings of the port only to get an idea about the tough industrial situation.

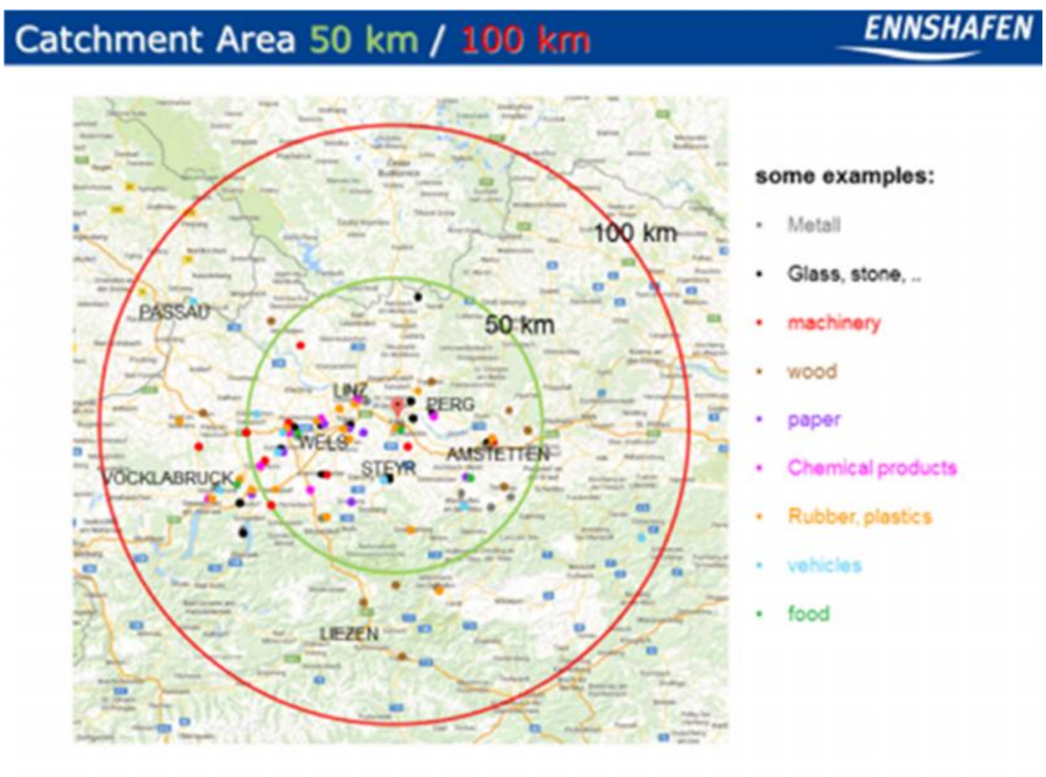

Figure 5: Industrial activities in the hinterland of the Port of Enns

(Source: EHOÖ)

General economic situation in the port´s hinterland (following figures for Upper Austria, the situation in the corresponding region of Lower Austria is quite similar).

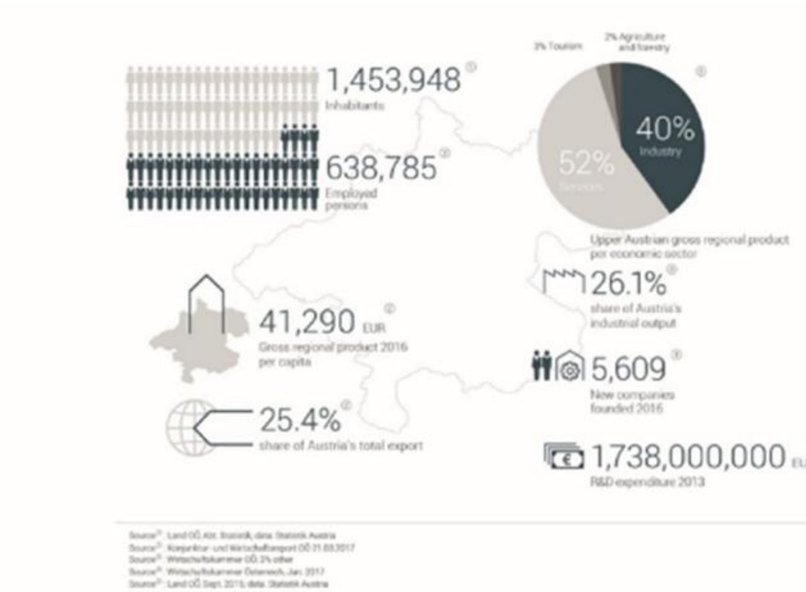

Figure 6: Economic indicators in the hinterland of the Port of Enns

(Source: EHOÖ)

Upper Austria summed up in a few words: a strong manufacturing location with industry-leading companies – it is no coincidence that Voest Alpine is shown in this slide, one of Europe's or even the world's most innovative steelmaking groups - and innovative SMEs. As a leading export, technology and industry province within Austria, Upper Austria offers everything companies need to be competitive in international markets: first class infrastructure, qualified specialists, innovative environment and the highest quality of life.

In figures:
two-thirds of regional value creation & 80 percent of research takes place in Upper Austria in industrial and industry-related services.
Increasing growth dynamics: GDP growth 2016 is 1.9%*
Unemployment of 6.1% (2016)
Job motor: between 2006 and 2015 plus 52,925 jobs (employees)
More information about the location Upper Austria please find in the hided slide number 4.
Example of successful Upper Austrian brands:

- KTM
- Silhouette
- PEZ
- Rosenbauer

Example of successful Upper Austrian companies:

- Engel machines for making Lego bricks: working together for 40 years, 2012 saw delivery of another 1500 injection moulding machines to Lego plants in Hungary, Denmark and Mexico

- BMW motors: in 2010, the BMW plant in Steyr produced more than 1,000,000 engines per year for the first time. And with 1,036,000 engines achieved a historic production record for the location.
- Lenzing Fibres: Lenzing fibres are used by international designers in their collections. Organic fibres from Lenzing are used to make Converse footwear. H & M, Zara and Levis are also customers, as well as IKEA who use their fibres for hand towels and bed linen

Decisions are made faster in Upper Austria than anywhere else and we are leaders in terms of implementation as well. Companies are able to relocate to Upper Austria faster than in other Austrian provinces. As an example, applications are approved within 21* days (compared to 44 days in the year 2000).
* Time taken by authorities (from submission of all necessary documents until decision is reached).
Competitive on an international scale and attractive for international companies:
The companies located in Upper Austria are competitive on an international scale with their products and services: 60 percent of Upper Austrian commercial output is for export markets - mainly Germany, USA, Italy, France, Czech Republic.

Upper Austria is also interesting as a location for international companies: almost 30 percent of the largest firms in Upper Austria have non-Austrian majority owners.

Over the last five years, 88 companies from abroad have located in Upper Austria, investing more than EUR 330 million in the location and creating almost 1000 new jobs.
Source: Business Upper Austria

4.1.7 Major port users

Main types of goods: fertilizers, animal feed stuff, grains, agricultural products, wood, salt, ores, iron and steel, scrap metal, high and heavy pieces, waste materials, gas (LPG), all kind of cargo in containers (content is confidential).

Unfortunately, no info on special customers and / or shares of cargo throughput of the major port users are available at the moment of writing this report, mostly due to the limitations imposed by the data protection laws.

Actual there are different users from local economy and a lot of logistic and industrial partners. Even special data according the shares of cargo cannot be published due to data security reasons (rough statistical summaries are available in the attached cargo statistics). Both import and export is proceeded in the Ennshafen port.

4.1.8 Potential port users

This topic has to be elaborated in the Daphne project work, WP 5, act 5.4. Detailed results will come up in the years 2018 and 2019. At the moment no exact data are available.

In general, in the project INWAPO conclusions were made for all the ports along the Danube river due for the following types of cargo. Even via donau performs 2 years programmes dealing with some of this cargo types (remark: some of these types of goods are not only processed by ship but even by rail or container – so the conclusion made in 5.1.3 for a total statistic of the whole port area is remarkable to get data for strategic development of the port):

- Agricultural products, grains, fertilizers, forestry products, feedstuff
- Metal ores, mining products, iron & steel, scrap
- Automotive components, machinery
- Waste and recycling products, renewable materials, chemical products
- Construction material
- Empty containers
- High & Heavy Cargo, Ro-Ro Cargo

4.1.9 Planned industrial and economic developments in the port's hinterland

A lot of planning (various states of concretisation) and negotiations are present for the port area (including the industrial business park) for the free space of the port area; due to confidential reasons these items cannot be reported here; actually some investments are just in performance like LNG fuelling station (and afterwards bunkering and storage), enlargement of a waste treatment factory, enlargement of the animal feedstock factory, new investments in ware houses. It can be estimated that in the next about 5-10 years there could be a total investment volume of about 100-220 mio € directly in the port & industrial business park. In the wider hinterland there are a lot of industrial and logistic investments permanently. These are normal developments of the very high develop status of the Upper Austrian and Lower Austrian industry. But actually no completely new project can be reported which will influence the situation into dramatic changes of cargo situation in general. In Upper Austria normally about 500 - 1000 mio € are new investments of companies per year – an often used figure in newsletters, … (nota bene: this is a very rough estimation and should not be compared with other regions without detailed statistic crosscheck).

Perhaps within the duration of Daphne project some new projects – with direct influence to cargo and logistic situation - come to dedicated decision and will be published.

4.1.10 Cargo statistics

The figures reported are only a part of the total cargo statistics of the total port area; these data contain the total waterside transhipment; the rail cargo is only partly included (only cargo processed on the quay space) because some of the railway lines are privately owned (in close neighbourhood to the quays) and no statistic figures are given from the companies to the port authority (still no obligation to submit data); the whole truck cargo is not included since there is no obligation to submit these figures. Even the container cargo is not included in this statistic. The details about cargo statistic is enclosed in the appendix.

After starting with business in Ennshafen port a general level of about 700-800000 t/a has been reached after several years of developing. Some highlights of about 1 mio t/ a were arrived from years with very much wood transhipment or transhipment of gravel. The general economic crisis shortened the figures down to about 500000 t/a but afterwards a steady improvement could be achieved. Problems occurred especially in 2016 due to bad waterway conditions of the Danube in Germany and Romania/Bulgaria.

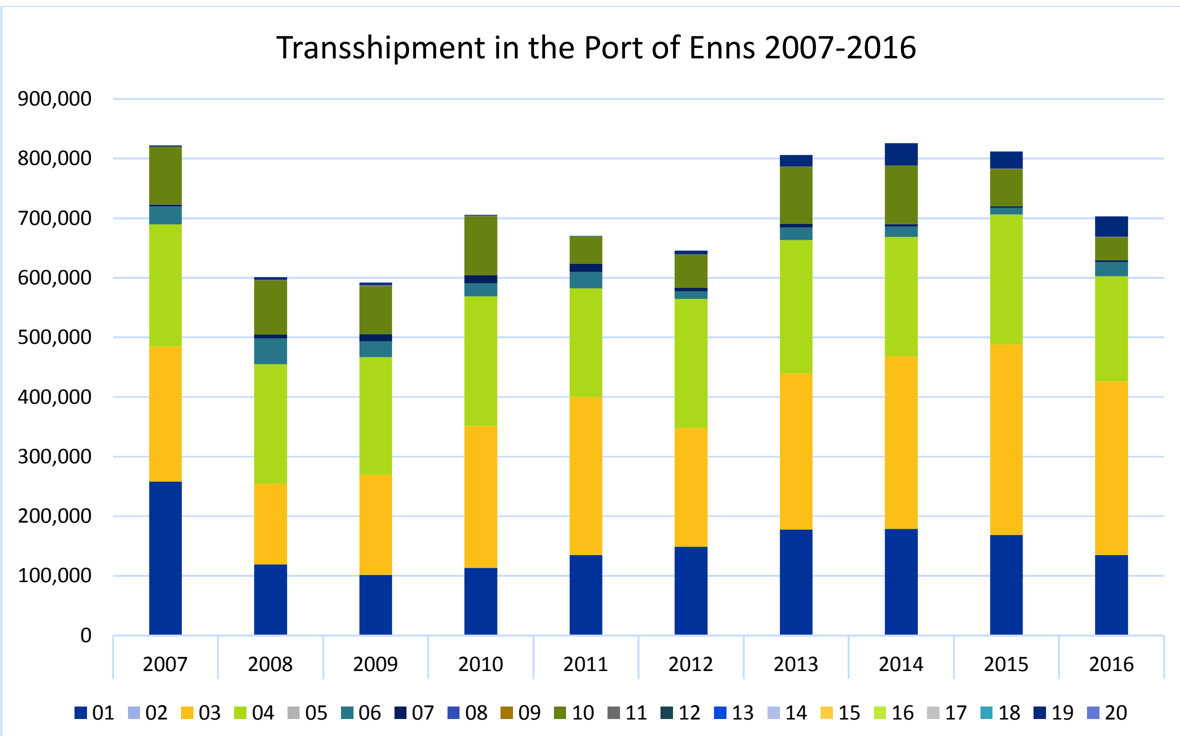

Figure 7: Transshipment in the Port of Enns

(Source: iC consulenten, based on data provided by EHOÖ)

4.2 Port of Vienna

The Hafen Wien is already the largest port on the Danube in Eastern Austria and its diverse logistical capabilities and capacities continue to be enlarged. Although it is 2.000 km from the Black Sea and 1.500 km from the North Sea, it has the great advantage of being the largest trimodal logistics centre in Austria, bringing together road, rail and water transportation and making it the ideal place for the transportation of goods and for container storage, trade and management.

4.2.1 Position

Port of Vienna is located on river km 1920 of the Danube, covering both left and right bank. Port has three different basins on three nearby locations: Freudenau, Albern and Lobau. In addition, Port of Vienna has a passenger terminal.

4.2.2 Ownership, administration (governance) and operation

Wiener Hafen, GmbH & Co KG is a member of a public company Wien Holding which ha 95% of ownership of Wiener Hafen, while the Vienna Economic Chamber (Wirtschaftskammer Wien) has a 5 percent share in the company. Wiener Hafen, GmbH & Co KG is the owner of the port facilities comprising real estate, buildings and wharf equipment and operates the harbours in Freudenau, Albern and Lobau.

Apart from ownership and operation of all storage and vehicle facilities and all real estate that is not directly located in the port, the company *Wiener Hafen und Lager Ausbau- und Vermögensverwaltung, GmbH & Co KG* is responsible for all crane operations required for cargo handling. It also manages the holdings WienCont.

Wiener Hafen, GmbH & Co KG and Wiener Hafen und Lager Ausbau- und Vermögensverwaltung, GmbH & Co KG form the unit publicly known as port of Vienna (Hafen Wien) offering solutions tailored to the needs of its customers.

4.2.3 Infrastructure assessment

The port area covers roughly 350 hectares of port land, in three cargo locations, accompanied by the area belonging to the passenger terminal and a marina for leisure and sport vessels.

Information on any port land available for the development of port-related activities was not available at the time of writing of this report. Nevertheless, based on the development projects that include the land reclamation from the waterfront areas within the port, it can be concluded that the port has no available space for development as it has to reclaim the space from the areas currently occupied by water surface of the port basins.

As mentioned earlier, the port has 3 port basins, providing for the maximum draft of 2,7 meters. Cargo handling capacity was not available at the time of writing this report, except in TEU/year, which reached 450.000 TEU/year.

Location Freudenau (rkm 1920.1)

Freudenau harbour (Figure 8) is the centre of the cargo handling facilities on the Danube in Vienna.

Figure 8: Port of Vienna – location Freudenau

(Source: www.hafen-wien.com)

It contains the handling amenities for bulk goods and raw materials, the container terminal, a car terminal, warehouses and depots, distribution centres for brand articles, the largest free port in Austria with a customs office and its own police station and the offices of Hafen Wien. It is also a haven and winter harbour. Following facilities are located in Freudenau:

- Management and general administrative headquarters
- Free port / customs office
- Warehouse and brand article distribution centre
- Car terminal
- Cargo handling terminal
- Container terminal
- Police station
- Haven and winter harbour

Location Albern (rkm 1918.3)

Albern harbour (Figure 9) handles building materials, agricultural and steel products. There are five large grain silos on the site with a capacity of 90,000 tons, making Albern the most important grain handling location in Eastern Austria. Following facilities exist in the Albern harbour:

- Building materials terminal

- Grain handling and storage
- Heavy goods handling
- Automatic weighbridge

Figure 9: Port of Vienna – location Albern

(Source: www.hafen-wien.com)

Location Lobau (rkm 1916.4)

On this location (Figure 10), the storage and handling of mineral oil production is provided. Every year around 1,000 tankers dock in the seven berths in the oil terminal and around one million tons of mineral oil products are handled there. The oil terminal is connected by pipelines to the central Lobau fuel depot and the oil refinery in Schwechat.

There is also a rail freight station connecting to the railway network. The terminal stations have online measuring systems and automatic loading systems. The pump and loading stations are on floating pontoons.

Figure 10: Port of Vienna – location Lobau

(Source: www.hafen-wien.com)

Passenger terminal (rkm 1928.3 - 1929.3)

The shipping centre/Schifffahrtszentrum (Figure 11) close to Reichsbrücke, operated by the Wiener Donauraum Länden & Ufer Betriebs- & Entwicklungsgesellschaft, on Handelskai in the 2nd district is Vienna's passenger shipping centre. Shipping companies, agencies and ticket offices are located in this area.

Figure 11: Port of Vienna – passenger terminal

(Source: www.hafen-wien.com)

General cargo and bulk goods such as agricultural products, building materials, metals, salts, vehicles and containers are handled in Freudenau and Albern. Liquid products such as mineral oil derivatives are handled at the Lobau oil terminal.

Heavy transports and motorboats are also handled in Freudenau.

- Highly qualified personnel ensure rapid and reliable processing.
- Bulk goods and raw material warehouses
- Open-air storage areas
- Crane installation with 6-160 t lifting capacity
- Mobile excavators
- Rail connection
- Covered loading zones
- Ro-ro ramp
- 2 weighbridges

The car terminal in the Hafen Wien currently has space for approximately 8.000 vehicles in an open-air area of approximately 200.000 square meters; covered space is available for 2.000 of these vehicles. It offers direct connection to all motorways and national and international railway networks as well as two high-performance ro-ro ramps for loading and unloading vessels, guaranteeing rapid delivery and transportation of vehicles.

Apart from the storage areas, the car terminal has the following facilities:

- 2 Washing installations
- Vehicle workshops
- Halls for cleaning vehicles and fitting of radios, spoilers and other accessories
- Petrol station, E-Petrol station
- Railway tracks for 50 vehicle transport cars
- Ro-ro facility (2 ramps)

The container terminal operated by WienCont, a subsidiary of Wiener Hafen, has an area of 120.000 square meters. The trimodal terminal connects the traffic modes of road, rail and inland waterways and offers a comprehensive range of services:

- Container handling from 6 to 45 tons with gantry crane and mobile handling equipment; daily block train connections to European seaports;
- Container storage: 7.000 TEU capacity; storage of all types including reefer points for refrigerated containers;
- Container repair and adaptation to individual customer requirements;
- Container business: the company buys and sells new standard and special containers;
- Container rental: the company's containers include not only storage and transport but also office and sanitary containers;
- Customs clearance;
- Incoming/outgoing road transport management.

Port of Vienna has more than 18 kilometres of quays and river banks, but only 5 kilometres of quay walls are operational (used for transport operations). Vertical quays are with a total length of 10.500 metres and sloped quays with a total length of 7.600 metres.

The anchorage capacity is 80 vessels in all three ports.

Bunkering facilities are available in the zone of the Port of Vienna.

Facilities for supply of alternative clean fuels (e.g. LNG, etc.) are not available in the Port of Vienna and no such plans or future projects have been reported.

Shore-side power supply facilities are not available in the port of Vienna. Waste collection facilities are available, but the info on the facilities for collection of used oils, oily waters, sludge and similar liquid waste was not available at the time of writing of this report.

4.2.4 Special infrastructure regarding surface pavement & drainage of rain water

No info available.

4.2.5 Hinterland connections (road, rail and IWW)

Access by roads: B 14 Freudenauer Hafenstraße along the port, highway connection in 500 m (A 4 Ost Autobahn and S 1 Wiener Außenring Schnellstraße; East and South) respectively, 3 km (A 23 Südosttangente; North and West). Total number of road entrances to port is 4 (including a passenger terminal), with 8 road lanes in total.

Access by railways: port locations are accessed by rail through connection to shunting stations Donaukaibahnhof (3 km, through Donauuferbahn) and Kledering (8km, through Winterhafenbrücke) and the main Austrian railway network, all providing 3 railway accesses to the port locations with minimum three railway tracks.

The port is located on the Danube River which is a part of the Rhine-Danube Core Network Corridor.

4.2.6 Hinterland (economic situation in the port's hinterland)

Hinterland of the port of Vienna is mostly related to the so called Vienna Region - including the three federal states Vienna, Lower Austria and Burgenland (Figure 12).

Figure 12: Vienna Region

(Source: www.viennaregion.at)

The central geographical location, its focus on advanced technologies and its top-ranked quality of life are three of the factors which catapult the Vienna Region into its ranking as Central Europe's leading economic region and as one of the EU's foremost economic areas. 45 percent of Austria's gross domestic product is generated in the Vienna Region.

As the capital of Austria, Vienna has the highest gross regional product of all Austrian federal provinces (GRP per capita 47,200 EUR). The economic structure is marked by a strong trend towards the service sector, a high number of business-related services, banking and insurance companies as well as international organisations and enterprises. The industry is currently characterised by the increasingly successful development of new technologies, for example life sciences, energy and environment, mobility, information and communication (ICT) and creative industries. Vienna Region has 3,7 million inhabitants.

Both, the strong manufacturing tradition of Lower Austria, (especially in steel and metal processing and in the chemical industry) and the flexibility of its entrepreneurs have enabled the region to profit markedly from the opening of Eastern Europe.

Compared to the rest of Austria, the service sector has a modestly developed share of the gross regional product of Burgenland. The industry is particularly based on food and beverage production, textiles and wood processing. During recent years the state has undergone change towards technology and tourism with the help of European structural programmes.

In averaged values for the entire Vienna Region, it needs to be noted that the Vienna Region contributes to 44% of the total Austrian Gross Domestic Product, with EUR 38.500 of GDP/capita (Vienna Region).

The share of the industrial sector (figures for 2013) in the economic output in Austria (28,2%) is high in comparison with the EU average (24,6%). Structure of value creation is as follows[2]:

Vienna City

- Primary sector (agriculture, forestry, fishing): 0,1%
- Secondary sector (goods production, mining, energy & water supply, construction): 14,5%
- Tertiary sector (trade and services): 85,5%

Lower Austria

- Primary sector (agriculture, forestry, fishing): 2,9%
- Secondary sector (goods production, mining, energy & water supply, construction): 30,3%
- Tertiary sector (trade and services): 66,8%

Burgenland

- Primary sector (agriculture, forestry, fishing): 3,7%
- Secondary sector (goods production, mining, energy & water supply, construction): 29,1%

[2] Quoted as per Vienna Region Business Atlas 2015, available at www.viennaregion.at

- Tertiary sector (trade and services): 67,2%

4.2.7 Major port users

The following major companies are part of the Hafen Wien Group: Wiener Hafen Management GmbH, WienCont Container Terminal Gesellschaft m.b.H. and Wiener Hafen und Lager Ausbau- und Vermögensverwaltung GmbH & Co KG. Wiener Donauraum Länden und Ufer Betriebs- und Entwicklungs GmbH and Marina Wien GmbH also belong to Hafen Wien. The Hafen Wien Group employs some 250 people in total.

Besides businesses belonging to the Hafen Wien Group, more than 120 companies specialising in logistics, trade, construction materials and fuels have settled at the Port of Vienna. These include logistics companies such as Schenker, DHL and Rail Cargo Austria, companies from the trade and construction sector such as Thyssen Krupp Stahlunion, Lafarge Perlmoser and Wopfinger Transportbeton, and companies from the fuel sector including OMV and Biodiesel Vienna. The enterprises in the Hafen Wien Group and the more than 120 companies located at the port employ some 5,000 people, illustrating how important the Port of Vienna is as a driver of economic growth for the Austrian capital.

Unfortunately, no info on shares of cargo throughput of the major port users was available at the moment of writing this report, mostly due to the limitations imposed by the data protection laws.

4.2.8 Potential port users

Since the scope and the available budget of this project did not allow for any detailed research on potential port users, especially on the potential volumes they might handle over the Port of Vienna, the following conclusions were made on the basis of the assessment performed in project INWAPO (Upgrading of Inland Waterway and Sea Ports), related to the potential cargoes for the port of Vienna.

<u>Automotive components and cars</u>

According to many experts in the automotive industry, the countries of the Danube region (especially in South East Europe) will additionally gain importance as location for car manufacturers. The most important advantages in terms of vehicle logistics are the waterway's capacity to transport mass volumes (up to 500 passenger vehicles in a 2-unit pushed convoy), as well as the high levels of safety and security offered by inland waterway transport. In this study promising potentials were first and foremost identified in the transport of new cars. Along with low transport costs, weekend driving bans in many European countries result in an additional competitive advantage of inland navigation.
In the recovery of end-of-life vehicles potential is identified in the transport of end-of-life vehicles from scrap yards to recycling sites. Metal scrap which is processed of end-of-life vehicles can also potentially transported by inland vessels to steel plants which are located close to the Danube.

Chemical products

In the Danube corridor relatively few chemical plants are located directly along the waterway. Consequently, transporting chemical products via the Danube waterway from or to the manufacturing plant usually means that pre- and post-haulage becomes part of the transport route resulting in additional costs. Establishing scheduled container transport services along the Danube, in combination with the necessary telematics systems for tracking raw materials and products (especially important for dangerous goods) represents an interesting transport alternative for the chemical industry.

With regards to product categories, the demand for fertilizers should further increase because of extensive farming land and an increasing purchasing power in South East Europe. Also the plastics industry expects further increases in transport volumes as many automotive companies are opening new factories in Central and South East Europe. The demand for chemicals is also expected to grow in the Black Sea region which can be served via inland navigation and short sea shipping.

Waste and recycling products

To use inland vessels to transport household waste, excavation waste and soil, scrap metals, glass, plastics and paper, whether in bulk or in containers, seems to be a promising solution. Given the fact that especially the Austrian scrap metal sector is mainly export-oriented and no specialized vessel types are required to transport waste and recycling products on the Danube, this transports could be an interesting back load for vessels transporting industrial raw materials upstream (e.g. iron ore, coal).

Given the fact, that this cargo is most of the time transported in large volumes and transport time does not play a major role, inland navigation can be in a competitive position compared to trucking and rail. As the prices for industrial raw materials constantly rise, the demand for recycled raw materials also increases at the same time. This is especially true for the developing countries of the Black Sea Region (e.g. Turkey).

Construction material

Due to the forecasted on going increase in construction activities in Central and South East Europe a higher demand for construction materials can be predicted for the Danube region. At the same time Austrian companies are opening new production and distribution locations in CEE and SEE countries.

In the field of raw materials natural stone has potential to be shifted on the inland waterway. Speaking of construction products cement and bricks show the highest potential for a modal shift. The presented best practices show, that companies are using the advantages of inland navigation in this sector. The main benefit for the construction industry is the advantage in terms of costs deriving from the bulk capacity of inland vessels. Construction material can be transported by conventional Danube vessels as bulk cargo, as goods on pallets or in containers.

Empty containers

Currently the trend points towards increasing costs for road transport caused by higher road charges, the development of fuel prices and weekend driving bans. Inland navigation is a cost-effective alternative for imbalances of rail and road transports, since transport time in the field of empty container steering does not play a major role in comparison to other types of transport. At the same time there is a significant number of ports having container terminals with high quality handling equipment. In addition, several depots for empty containers were built and extended in the vicinity of the Danube over the last years.

Renewable resources

Austria to a large extent supplies its domestic production with domestic raw materials. So far Austria was net exporter of grain which might change due to the rising demand for energetic use and in the case of a bad harvest. In the field of bioethanol, inland waterway transport will play a major role for the transport of raw materials in the future. A mix of all transport modes is required.

In terms of raw materials for the production of biodiesel high amounts of oil seeds and oil will have to be imported in future due to an ever rising demand. With stricter regulations regarding the mandatory blending of mineral diesel with biodiesel the amounts transported on the Danube could significantly increase.

The main growing areas of the wood industry in all countries in the Danube region either have relatively good rail connections (e.g. Bavaria, Austria) or are located at a large distance to the waterway (e.g. Ukraine, Romania). In most of the cases the required pre-haulage to the Danube is rather complicated. Due to a high density of railway sidings, the competition by other modes of transport is fierce. On the other hand, there are still free capacities in inland navigation. With its bulk capacity inland navigation is a good transport choice for round wood and wood products.

High & Heavy Cargo

High & Heavy cargo has a high potential for Danube navigation. In the future the growing markets in South East Europe and the Black Sea Region will bring a big increase of H&H transports especially for the construction industry (e.g. bridges) and energy supply (e.g. wind energy). Furthermore, there is a trend towards ever larger cargo. At the same time the maximum sizes allowed on roads and motorways could be potentially reduced to improve the safety on the road. This could lead to an additional shift of oversized and heavy cargo to inland navigation.

The transhipment from road to rail or inland navigation needs special equipment. Some special ports exist along the Danube and the Rhine which offer adequate crane capacities. In addition, mobile cranes and Ro-Ro transhipment technology also offer reasonable possibilities for the transhipment of High & Heavy cargo.

Machinery

The Austrian machinery industry is well-positioned and internationally competitive in the fields of plants for metallurgy, plastics machines, machines for railway engineering, chemical plants, energy mechanical engineering and mining technology. There are also intense transnational trade relations with Eastern Europe in this sector.

Thus machines have a high potential for a modal shift towards inland waterway transport. In South East Europe there is especially an increasing demand for agricultural machines as efficiency in the agricultural industry grows and purchasing power increases. Along agricultural vehicles other rolling cargo can also be transported conveniently in large volumes by inland vessels as there are many Ro-Ro ramps available in South Eastern European ports.

Paper and pulp

The paper industry represents a key market with Austria being one of Europe´s most important paper producers. Currently almost the half of the transport volume is transported by rail, the other half by trucks. Inland navigation only plays a minor role. In terms of volumes, trade flows and locations there is potential for paper, paper board and card board to be transported by inland vessels with a special focus of raw materials and recovered paper. The main import countries and export countries for paper, paper board and card board are located in the Danube region (e.g. Germany (to some extent), Hungary, Slovakia, Croatia).

4.2.9 Planned industrial and economic developments in the port's hinterland

No info available

4.2.10 Cargo statistics

Only figures for 2016 cargo statistics were available at the moment of writing this report:

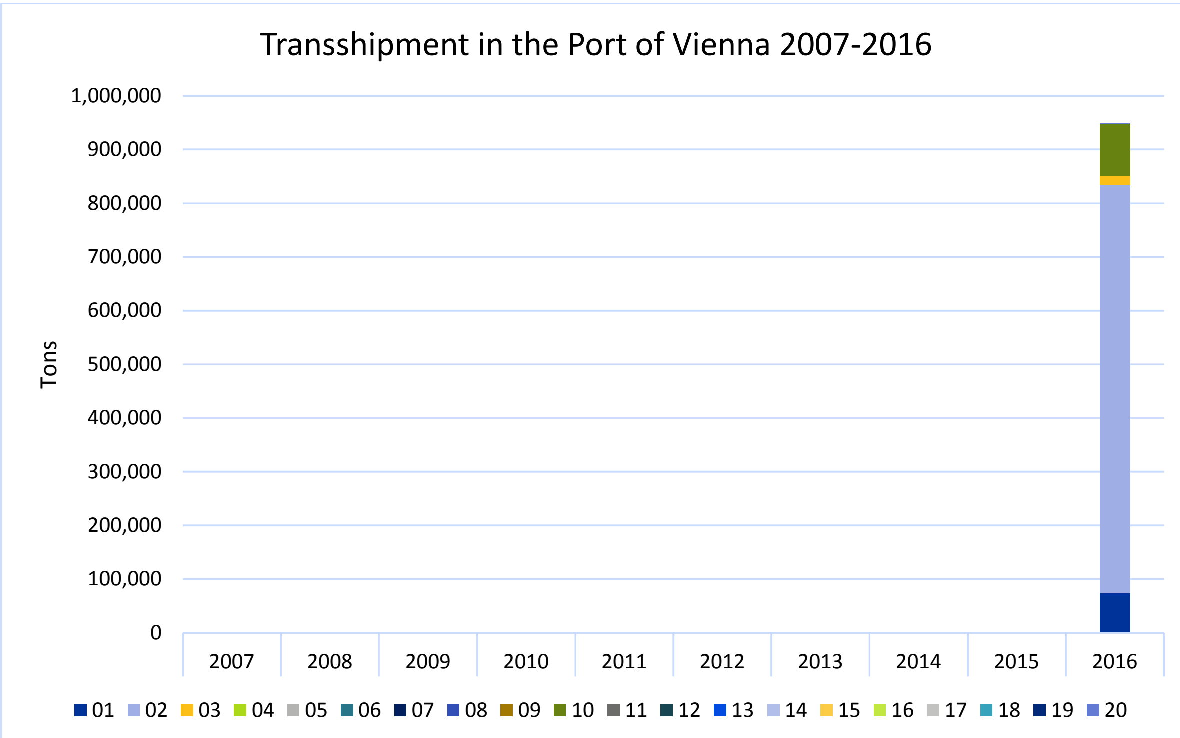

Figure 13: Transhipment statistics in the Port of Vienna

(Source: iC consulenten, based on data provided by Hafen Wien)

The largest share of cargo belongs to the oil products, handled mostly in the Lobau terminal. Oil products are followed by metal and agricultural products. It needs to be noted here that roughly only 10% of the total throughput of the Port of Vienna belongs to inland waterway transportation, while the rest belongs to land-to-land (rail-rail, rail-road, road-road and road-rail) transshipment. Such statistics were not available. Detailed data on the cargo structure are provided in Annex II.

4.3 Port of Bratislava

Port of Bratislava is the most important strategic port in Slovakia on the international Danube waterway. Currently it fulfils the functions of a universal cargo and passenger port. The port's potential is enhanced by its excellent geographical location at the crossroads of the Rhine – Danube and Baltic Sea – Adriatic Sea corridors of TEN-T transport networks and easy access to other European capitals and important ports in Vienna and Budapest. Bratislava Port is a complex of water bodies, hydro technical installations, port basins and related infrastructure, facilities and storage areas served and connected to both rail and road transportation networks and infrastructure.

4.3.1 Position

Bratislava port includes port basins and both banks of the Danube between river kilometres 1.867,29 to 1.862,00.

Figure 14: Port of Bratislava

(Source: www.skyscrapercity.com)

4.3.2 Ownership, administration (governance) and operation

All lands of the Port of Bratislava are owned by the company Public Ports Slovakia, whose founder is Slovak Republic represented by the Ministry of Transport and Construction of the Slovak Republic.

The infrastructure and superstructure situated in the Port of Bratislava is owned by the private company.

Public Ports Slovakia is the port authority of the Port of Bratislava, while the main operator in the Port of Bratislava is a private company Slovenská plavba a prístavy, a.s.

Port authority is separated from port operator.

4.3.3 Infrastructure assessment

Total surface area of the port of Bratislava is 156,68 ha, while a total area of 95 ha is available for further port development.

Land Infrastructure of Public port Bratislava consists of 10 basic sections:

The first transshipment section (bulk terminals + general cargo terminal) is equipped with 2 GANZ 16/32 portal gantry cranes, a sloping quay in length of 650m, an area of free dumps / reinforced areas with an area of 10760m2. Within this transport section are stored: bulk goods, ferro-materials, or piece goods.

The second transshipment section (bulk terminals + general cargo terminal) is equipped with two 16/32 GANZ gantry portal cranes. Within this transfer section, three transitions are created. Part of this section is 400m long quay. The area of free dumps is 4800m2. The indoor warehouse area is 4000m2. In this transport section are stored: bulk goods, ferro-materials, or piece goods.

In the third transshipment section (bulk terminals + general cargo) there are 2 GANZ 16/32 gantry portal cranes. It includes a 370m long quay and 3 transitions. The area of free dumps is 5200m2. The indoor warehouse area is 7250m2. This transshipment section stores: bulk goods, ferro-materials, or piece goods.

The fourth transshipment section (Bulk terminals + General cargo terminal) has 3 gantry portal cranes - 1 GANZ 16/32 crane, 2 GANZ 5/6 (older type) crane. The area of free dumps is 12960m2, the area of indoor warehouses is 2600m2. Stored goods: bulk goods, piece goods.

In the past, the fifth transshipment site (without rail access) was used to tranship mineral oils. Currently, it is used for refuelling vessels (diesel).

The sixth transport section (bulk terminal) is currently not used, it is made up of a hard surface and quay. Currently, the establishment of the trimodal transshipment terminal is considered within this section.

The seventh transshipment section is used as a container terminal. Its area is 24000m2. Storage capacity within this terminal is 1400 TEU. In this section is located the bridge gantry type KSB 32 / 36. This terminal is operated by a private company Slovenská plavba a prístavy, a.s. Container terminal in Bratislava has a direct regular railway connection by means of container to shuttle trains: Bratislava - Mělník and vice versa, Bratislava - Bremerhaven and vice versa, Budapest - Bratislava.

The transshipment section number eight forms the RO-RO position and the transshipment of the heavy oversized goods via the KBS 300 tonnes crane. Free dumps area is 5700m2. On the RO-RO facility the port reloads vehicles and goods, loaded on wheeled vehicles (saddle trailers, trailers, roll-trailers and fork lifts) using horizontal method. The facility is equipped by a ramp between the river bank and ship, suitable for units up to 560 tons. The port is capable to load or unload 400 and more cars per shift by its horizontal technology. Cars and goods are carried by specialized single - or more decker RO-RO barges, belonging to shipping companies.

The ninth transfer section (Oil terminal, without rail access) serves as a transporter of mineral oils (diesel, gasoline), transhipping from the Slovnaft refinery using the Dalby system. They include sloping quays.

The tenth section (without rail access) forms positions to repair vessels.

In total, the port of Bratislava has 8.455 m of quay walls, out of which 3.138 m is vertical quay and 5.317 m of sloped quay. Total length of the undeveloped quay, available for further port development is 615 m.
Anchorage capacity amounts to 84 vessels, with the total surface of 23.028 m^2. Vessels carrying dangerous cargo are also allowed to anchor at the anchorage.

Bunkering facilities are available at the bunkering terminal. Currently, the port of Bratislava does not have any facilities for alternative fuels supply, but an LNG terminal with fuel supply facilities for vessels and land vehicles is planned and a project for such facility has been approved by relevant authorities.

Shore-side power supply facilities are available, as well as ship generated waste collection facilities. No facilities for collection and/or processing of oily wastes (oily water, bilges and sludge) exist in the port of Bratislava.

4.3.4 Special infrastructure regarding surface pavement & drainage of rain water

Public ports j.s.c. do not own the facilities or equipment that has the role regarding surface pavement and drainage of rain water systems. Under the Act No.338 / 2000 Z.z. About inland navigation our company is performing out the operation of the public port operator of the Slovak Republic. The water surface of the port as well as the Danube waterway is managed by the water management manager, the company Slovak Water Management Enterprise. The water manager also covers the floods at the increased water level.

4.3.5 Hinterland connections (road, rail and IWW)

The port is located at the intersection of other international European highways – road and rail connection (multimodal transport corridors No. IV and V, with parts of the highways D1, D2 starting from Bratislava (direction Žilina , direction Kúty - CZ) Bratislava - Berlin - Hamburg, Bratislava - Žilina - Warsaw, Bratislava - Košice - Kyjev / Moskva, Bratislava - Štúrovo - Budapesť - Bucharest).

Rail connection to the Central Freight Railway Station Bratislava, from where it is connected to the port siding in the cargo port of Bratislava and also to the SLOVNAFT complex.

The IWW (Danube) is part of the TEN-T Core Network and its multi-modal Rhine-Danube Core

Network Corridor (RD CNC), with the Port of Bratislava being one of the core ports on the RD CNC.

4.3.6 Hinterland (economic situation in the port's hinterland)

In the port of Bratislava, every second year there is a tendency to tranship around 2 million tons of goods. There is a big role of the DALBY terminal, which is located on the 9th transshipment section, which tranships the oil products from the SLOVNAFT refinery, and which tranships about 600-700 thousand tonnes every other year. The economic situation of the cargo port in Bratislava is affected regards to the only operator of the port company Slovenská plavba a prístavy, a.s., which operates on the most of the transport sections (bulk, piece, container, Ro-Ro position and heavy and oversized position).

Inland waterway transport is mostly from March to December, but more intense months are from April to November.

Public ports runs statistics only for transhipment and Inland waterway transport. Since the defined area of the Bratislava public port also includes the passenger of Bratislava, the development of the economic growth tends to grow.

The ports hinterland experienced long term expansion which were caused by wide investments into ports, road and rail infrastructure and facilities for transhipment and manipulation of goods. Development of the ports is affected by the development of GDP. With the increasing of the cargo transport there is the possibility of future development of all the ports and this can affect the economic situation both in Bratislava and other ports. Economic situation in the ports hinterland tends to increase in the future.

4.3.7 Major port users

Among the former users of the cargo port is the company Slovenská plavba a prístavy, a.s., which, in addition to the operator of the port, also carries out the transport of goods by a fleet of vessels, consisting mainly of pushboats and tugboats. The company Slovenská plavba a prístavy, a.s. uses a total of 9 transshipment sections operated by subsidiaries (eg Dalby 9. Transit section for transhipping liquid goods - petroleum products).

In 2016, imports amounted to 89 thousand tons while exports to 1 880 thousand tons. Mostly, exports of petroleum products (diesel, gasoline) and bulk goods, as well as artificial fertilizers and steel coils and rails. Imports were influenced by the level of demand.

More details information on the activities of port users were not available due to confidentiality policies of the port operator.

4.3.8 Potential port users

Based on the forecast for the transport of commodities on the Danube, an increase in commodity transport by waterways is expected in almost all segments by 2020.

There is a certain number of industries connected to port. According to "Updated conception", export accounts for about 93% of the cargo at the Port of Bratislava. Typical export commodities by barge include light fuel and heavy fuels, ores, metal scrap and steel products. There are refineries that use the Danube to export its oil products to countries like Austria and Germany. But the volume of such ship freight (700.000 tonnes) is relatively low compared to what is transported via rail (2,2 million tonnes) and what is transported via product pipelines (2 million tonnes). The other firm that specializes in producing chemicals and fertilizers also uses the Danube to export about one fifth of its products, approximately 200.000 tonnes annually, to its customers in Central Europe and Germany. For imports, cargo like foods and feedstuffs, chemicals, liquid gas, fertilizers, ores, metal scrap and steel products are typically transported by inland waterways. In some cases, raw materials and gas would be firstly imported through other ports such as the Port of Constantza then transported by river to the Port of Bratislava.

For these identified products with the potential and appropriate conditions for transport through the waterway, an increase in the Danube waterway will be expected in the future.

4.3.9 Planned industrial and economic developments in the port's hinterland

Nowadays there is planned the project of Construction of the LNG Terminal in public port of Bratislava. The aim of the project is not only to contribute on the modernisation of services in public port of Bratislava but by the support of loading of infrastructure for alternative fuels to contribute on decreasing the negative impacts on the environment. Realisation of the project will contribute to the greening of the public port of Bratislava in accordance with the loading requirements of alternative fuels in the public ports within European Union. Project is aimed at ensuring construction of the LNG terminal incl. bunkering station for LNG transfer on the Danube river and bunkering options for vessels. The terminal will also serve for the other transport modes as a fuel station.

4.3.10 Cargo statistics

The trend in the Bratislava cargo port is mainly in the transshipment of petroleum products (diesel, gas) to Austria, Germany and a bulk cargo that is heading to Linz, Regensburg. Even in smaller quantities, however, the transport of artificial fertilizers and metallurgical materials such as steel coils and rails also plays a major role. Transhipment statistics are slowly increasing. For example, the evolution of oil transshipment: 2014 – 332.651 tonnes, 2015 – 518.642 tonnes, 2016 – 415.040 tonnes. Overview of cargo throughput is given in Figure 15, while the detailed data are provided in Annex II.

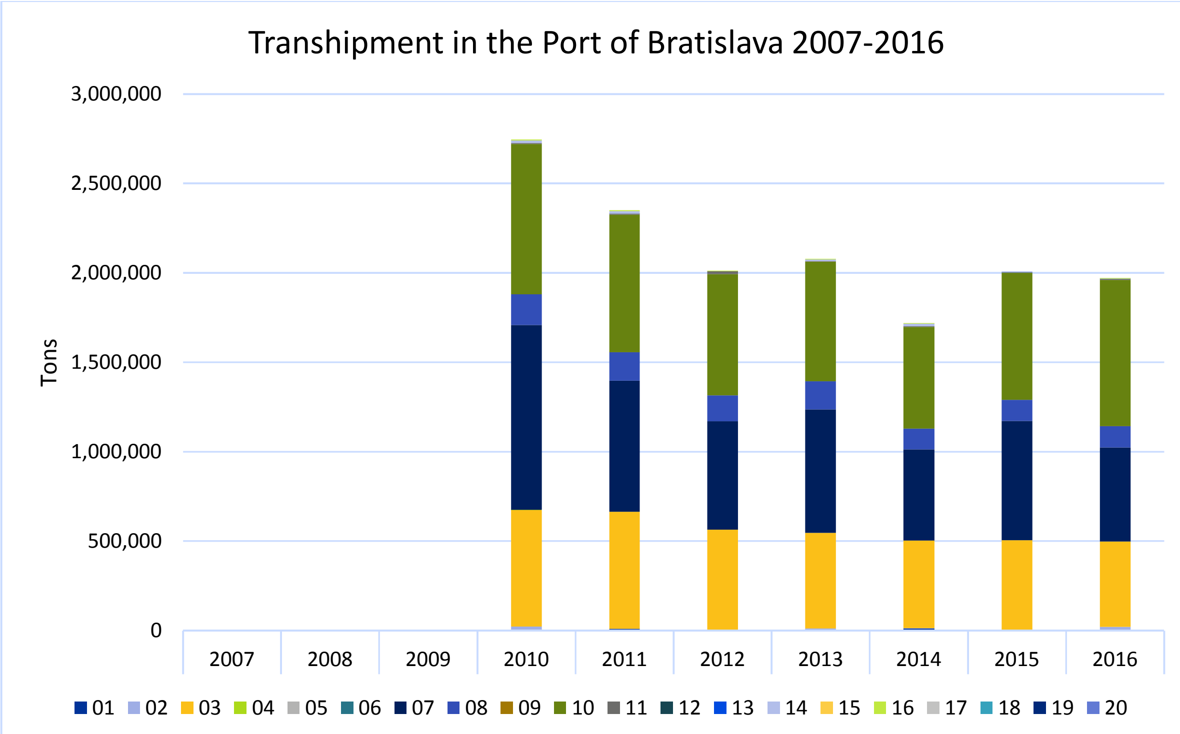

Figure 15: Transhipment statistics in the Port of Bratislava

(Source: iC consulenten, based on data provided by VPAS)

4.4 Port of Komarno

Komarno Port is the second most important port in Slovakia. The port is 100 km downriver from Bratislava Port. The port is also considered the terminus of the Váh inland waterway planned to connect Žilina with the Danube.

Komarno Port is a public port used for the transshipment of goods between rail, road and water transport directly or using temporary storage in port facilities. Conceptually, technologically and structurally, Komarno Port is built for the transshipment of bulk materials. The port can also be used to protect vessels in this section of the Danube and a portion of the Váh in emergencies (flooding, ice floes, high water conditions, etc.). In terms of passenger traffic, the port is primarily used in the summer months by pleasure craft in the open channel of the Danube.

4.4.1 Position

Komárno Port is located on the left-bank of the Danube between river kilometres 1,770.00 and 1,762.00. The port is divided into west and east sections. The port is partially located on the riverbank and in a shared pool used by the port and a shipbuilding facility. The port site is spread out over more than 20 hectares.

4.4.2 Ownership, administration (governance) and operation

All lands of the Port of Komarno are owned by the company Public Ports Slovakia, whose founder is Slovak Republic represented by the Ministry of Transport and Construction of the Slovak Republic. The infrastructure and superstructure situated in the Port of Komarno is owned by the private company. Public Ports Slovakia is the port authority of the Port of Komarno.
The main operator in the Port of Komarno is a private company Slovenská plavba a prístavy, a.s. Port authority is separated from port operator.

4.4.3 Infrastructure assessment

Total surface area of the Port of Komarno amounts to 20,12 ha, while an area of 5,4 is available for further port development.

The port is a combination of open shore and basin type port and the port has two basins where port operations are performed. Maximum draft in the port is 7 meters, which is more than enough for any of the vessel types navigating on the Danube. The port is open 84 hours a week.

The port can handle full block trains in the port area and is equipped with equipment and facilities for intermodal transport. The port has no capacities for handling heavy lift and out of gauge cargo.

Total length of the quay wall in the port is 5.445 m, out of which 1.112 m are vertical quays and 4.333 m are sloped quays. The port has no undeveloped quay walls available for further extension.

Capacity of the anchorage is 50 vessels, with the total anchorage surface of 25.472 m^2. Vessels carrying dangerous cargo are allowed to anchor at the anchorage positions.

Bunkering facilities are available in the port area at the bunkering terminal. No facilities for supply of alternative clean fuels are available, and no such facilities are planned in the forthcoming period. Shore side power-supply for vessels is available.

Waste collection facilities exist in the port, while no such facilities for collection of oily wasted (oily waters, bilge water, sludge, etc.) are available in the port.

First transshipment section (bulk terminal +general cargo terminal + oil terminal) is situated along the Danube main stream. Stored goods: bulk goods, ferro-materials. There are 8 positions for this transshipment, with 4 GANZ 16/32 gantry crane gantries, the remaining 3 positions are used for oil transhipment - but they are used only temporarily for fuelling (diesel). The section has wide slopes along the entire width.

Second transshipment section (bulk terminal +general cargo terminal). 10 transshipment positions along the northern bank of the western pool in the total length of 1000m. Stored goods: bulk goods, ferro-materials. There are 4 GANZ 16/32 tonnes cranes.

4.4.4 Special infrastructure regarding surface pavement & drainage of rain water

Public ports j.s.c do not own the facilities or equipment that has the role regarding surface pavement and drainage of rain water systems. Under the Act No.338 / 2000 Z.z. About inland navigation our company is performing out the operation of the public port operator of the Slovak Republic. The water surface of the port as well as the Danube waterway is managed by the water management manager, the company Slovak Water Management Enterprise. The water manager also covers the floods at the increased water level.

4.4.5 Hinterland connections (road, rail and IWW)

The port is located at the intersection of two major roads no. I/63 and no. I/64. and near to cross-border bridge over the Danube river between Slovakia and Hungary. It has three road entrances.

Rail connection of port is connected to the port siding in the cargo port of Komarno and also to Hungary. In Komárno port there is a railway siding with a total length of 14.4 km. In the eastern part, the railway siding consists of the transshipment tracks No.2 and No.4 and a total of 13 ladder tracks. In the western part are used for the transhipment tracks No. 1, 3 and 5 with the combined weight. The harbor station, which includes the railway siding of the harbor, is the Komárno railway station.

The IWW (Danube) is part of the TEN-T Core Network and the Rhine-Danube Core Network Corridor. The port is located close to confluence with the river Vah (an inland waterway of international importance).

4.4.6 Hinterland (economic situation in the port's hinterland)

The hinterland ports experienced long term expansion which were caused by wide investments into ports, road and rail infrastructure and facilities for transhipment and manipulation of goods. Development of the ports is affected by the development of GDP. With the increasing of the cargo transport there is the possibility of future development of all the ports and this can affect the economic situation both in Bratislava and other ports. Economic situation in the ports hinterland tends to increase in the future.

4.4.7 Major port users

The most important users of the Komárno cargo port include the operator of the port and the Slovenská plavba a prístavy, a.s., as well as the Romanian vessel operators, NAVROM GALATI. No information on exporters/importers and their cargo was available at the moment of writing of this information.

4.4.8 Potential port users

There is possibility for potential use of the port for oversized and heavy freight services, including a large number of container and other goods such as loose materials, agricultural products stored in silos, LNG, etc.

4.4.9 Planned industrial and economic developments in the port's hinterland

Industrial and economic development in the port of Komarno is planned by the project of Modernisation of Komarno public port. The goal of the Modernisation of Komárno Public Port project is to restore its place in the national economy and within the international TEN-T network corridor. Given that the current location of the port is in close proximity to the residential and historical core of the city of Komárno, there is a long-term need to transfer cargo transport to a new location.

4.4.10 Cargo statistics

The current status of the cargo port of Komárno is demanding, which means that the port is not specific to the transported commodity all year round, but rather according to the period, Products of agriculture (corn in 2015 – 45.000 tonnes, in 2016 – 21.000 tonnes; wheat in 2015 – 31.000 tonnes, in 2016 – 92.000 tones; this is all export) or artificial fertilizers or coke both to 20.000 tonnes. Port records for the last time recovery, as: in 2014, it was 63.283 tonnes of transported goods, and in 2016 it is already 148.000 tonnes. Overview of cargo throughput is given in Figure 16, while the detailed data are provided in Annex II.

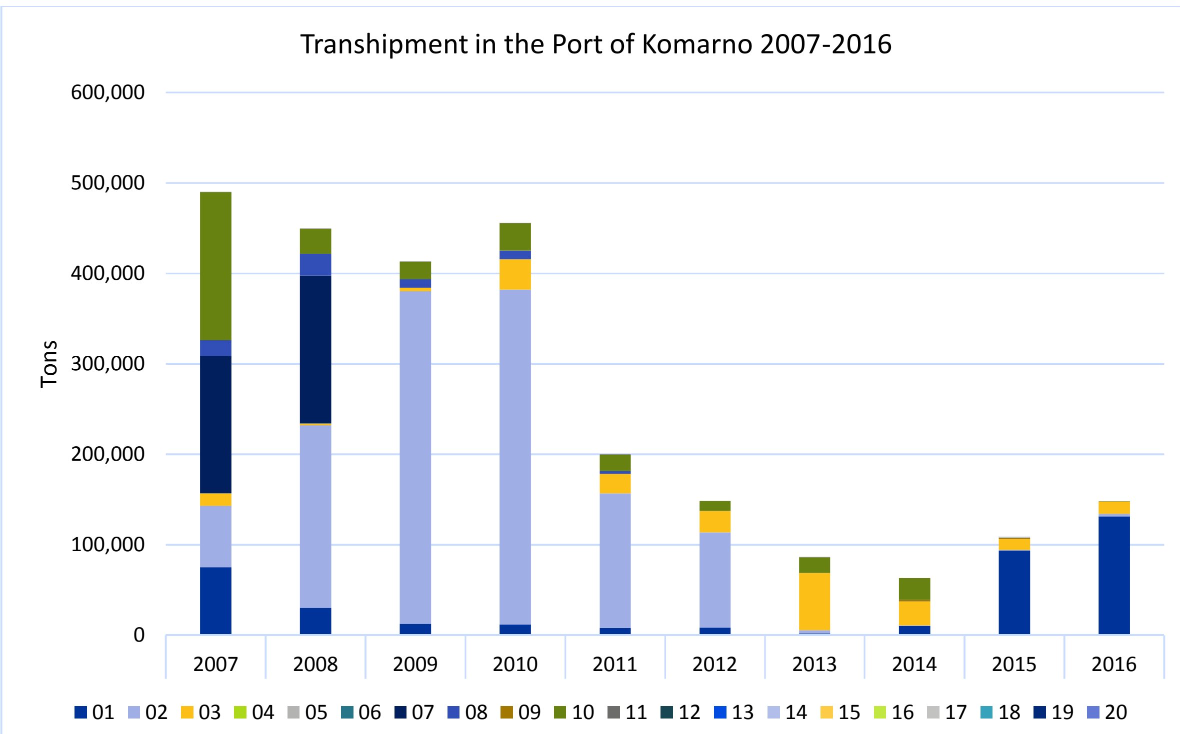

Figure 16: Transhipment statistics in the Port of Komarno

(Source: iC consulenten, based on data provided by VPAS)

Interreg
Danube Transnational Programme
DAPhNE

4.5 Port of Komarom

4.5.1 Position

Port of Komarom (also known as Port Danube) is in the area of the city, connected to its twin town on the Slovakian side, Komarno (Révkomárom) by the Danube Bridge. Its address is 2900 Komarom, Rákóczi quay 1. Komarom is the fourth largest city in Komárom-Esztergom County, Central-Transdanubia, Hungary according to its population. The city is located equal distances from Budapest and Vienna as well. The port is located on river km 1767 on the right bank.

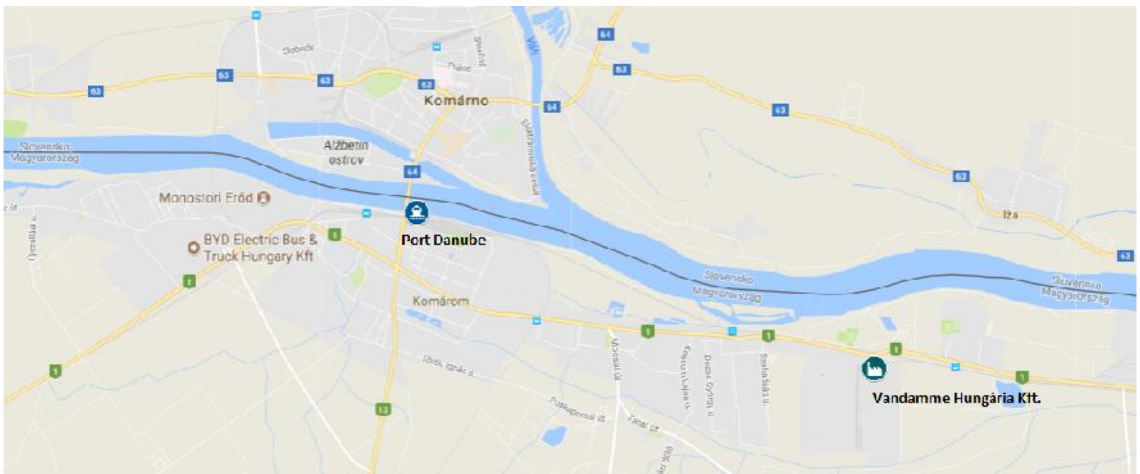

Figure 17: Location of the Port of Komarom

(Source: HFIP by Google Maps, 2017)

4.5.2 Ownership, administration (governance) and operation

Land and infrastructure of the Port of Komarom is owned by private company Port Danube Ltd. Port Danube has its headquarter in Esztergom. The company's branch has been operating in Komarom since 2013. Port Danube Ltd. is a member of and owned by Strigonium Plc. However, the port operator is Water Team Ltd. Next to the freight traffic port, there is a passenger port, which is operated by MAHART PassNave Ltd.

4.5.3 Infrastructure assessment

The area of the station is 24.777 m2. It has a 934m long waterside area directly connected to the Danube, where there are currently 4 ports operating for the reception of cargo and passenger ships, one of them operates as a floating docking station.

In terms of navigability, ports can be used regardless the water level and time of the year, even in low-water periods, when only a few section of the Danube can be navigated without restrictions. The water side of the area has a waiting space.

Alongside the port, the railway station joins a 260m long railroad track being able to be used to receive standard guidance. Freight trains can be unloaded and loaded in a solid paved area. Capabilities of the international waterway, rail, road and border crossing have the right water depth and the port's construction offer exceptional opportunities. Port has a weigh, but high water-level (especially flood) can cause issues. Storage capacities should be developed in the port area by investing in a silo with legs that could support or substitute the current mobile silo, because currently, it is not possible to store anything in the area of the port due to physical limits and lack of space.

Thanks to the old but still operating floating crane and the new double crane purchased in 2015, unloading rail and road vehicles and loading vessels are easy and quick. Especially the new Sennebogen crane is helpful, as it is able to load two ships separately, parallel.

The Port of Komarom is the last sort of reservoir of the Danube that is capable of supplying a completely new function on the Central and Eastern European Danube River because of the distribution, transhipment or the size of the area. In the Port Danube area, there are 2 office buildings fully equipped with public utilities (water, electricity, gas, telephone lines) with a floor area of 900 m2 where the office layout can be freely changed.

4.5.4 Special infrastructure regarding surface pavement & drainage of rain water

There would be no development, construction work allowed by authorities if channel and water system in the area of the port washed oil and other polluting materials into the river. However, except the channels built in a way considering legislative environment, there are no other, sustainability related infrastructure elements in the port area.

4.5.5 Hinterland connections (road, rail and IWW)

Port of Komarom is located on the right side of the Danube in the 1.767 km of riverbank in the middle of the Vienna-Bratislava-Budapest triangle. Accessible on road and by rail. Motorway E60/E75 is 8 km away, highway M1 is in 0.4 km. Near to the harbour, Komárom railway station has a major role in serving on the Vienna-Budapest axis and its region. There is currently an international freight traffic in the area of the Port of Komarom. The current freight activity of the port is to provide bulk goods and loading them and to provide associated port services. Due to the geographic characteristics of this area, this activity can be expanded with additional logistics solutions. Komárom industrial park is accessible by road. Danube Bridge used for international freight traffic, connects Slovakia and Hungary, just next to the port. Since the Port Danube lies at the intersection of international water, rail and road transport routes, it is also suitable for intermodal logistic tasks.

4.5.6 Hinterland (economic situation in the port's hinterland)

Recently, there have been plenty of development and construction work completed in the City of Komarom and its area. Next to the industrial park a 40-ha greenfield investment has begun, the port has been renewed and the Danube bridge will be also built by 2018 contributing to a well-built north-south traffic corridor. By completing the Danube Dam, more and more investments and development could be started in the field of tourism. Supporting infrastructure and public institutions will be easier with the HUF 200 million grant the local government received.

The area of the industrial park has been developed through a cross-border EU tender submitted jointly with the Slovakian Ogyalla. The development of HUF 600 million affected the public works of the industrial park, the expansion of infrastructure, new roads, sidewalks, rainwater drainage and public lighting.

Taking a look at the industrial production in the port's hinterland, Komárom-Esztergom County and its region, Central-Transdanubia, it is visible how little the differences are among each regional level. After the world economic crisis in 2008, a slow increase can be noticed. According to the trends, county values are overtaking the regional and national ones.

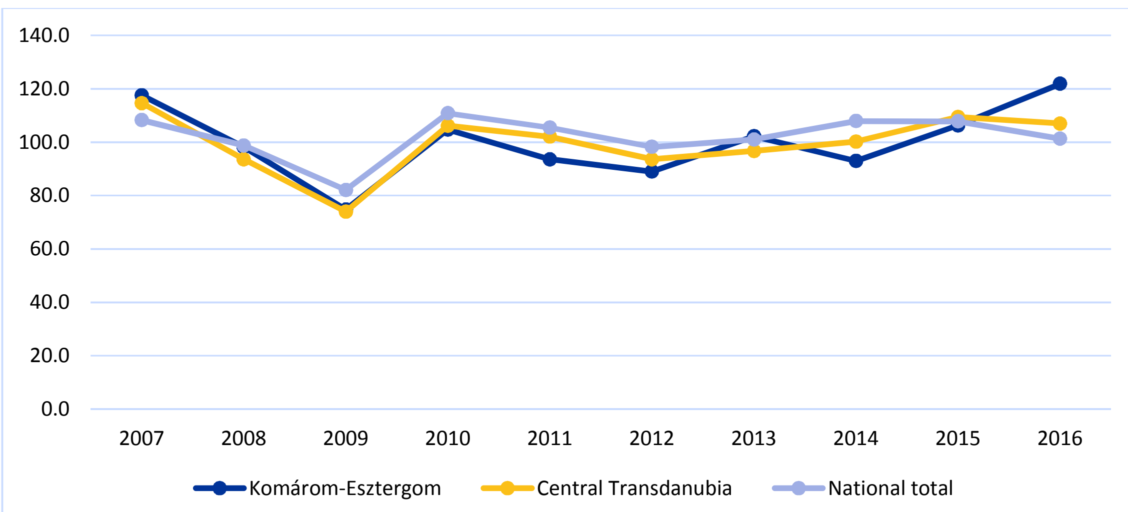

Figure 18: Volume of industrial production and volume index by site (same period of the previous year = 100.0)

(Source: HFIP, based on KSH data)

Due to the profile of Port of Komarom, its current infrastructure and facilities which are basically related to bulk cargo traffic, main types of crops and their harvested amounts in the county are presented below from the previous years. It foresees the importance and potential added value of the port as the quantities are to be growing. Since the great drought in 2012, amounts of all kind of crops harvested have been growing.

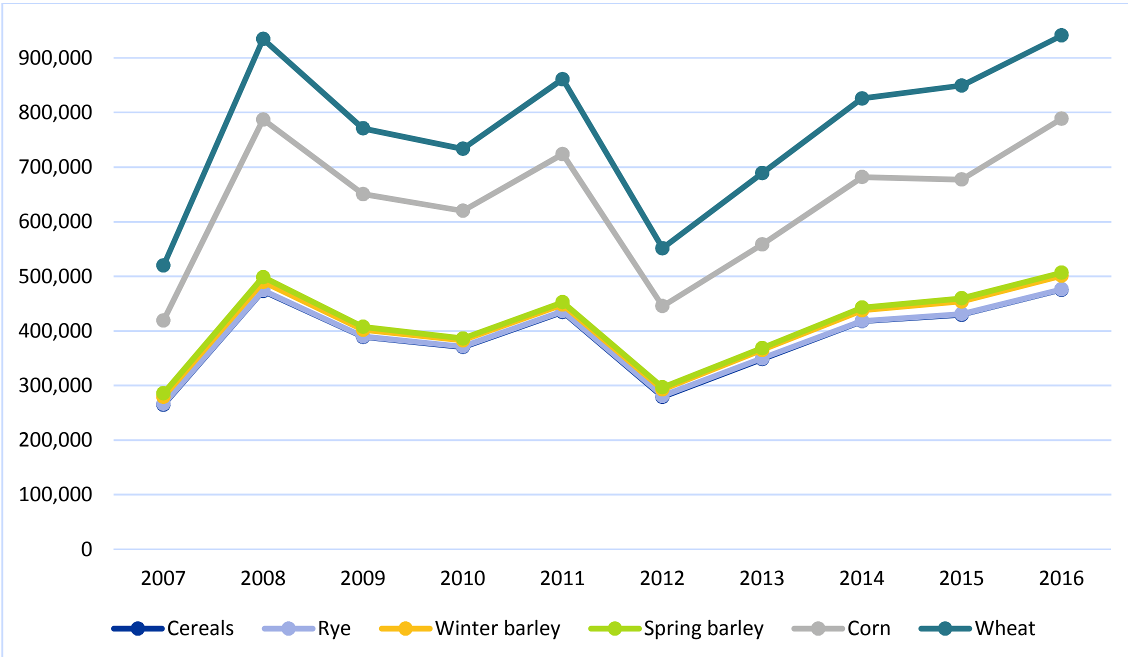

Figure 19: Harvested crops in Komárom-Esztergom County, tons (2007-2016)

(Source: HFIP, based on KSH data)

4.5.7 Major port users

Due to the main profile of the port of Komarom, which is bulk cargo, companies transporting cereals and fertilizer are the major present and potential port users. The most significant users of the port nowadays are

- Centroport Ltd.
- Vandamme Hungary Ltd.
- Euro Bevrachting
- IKR Agrár Ltd.
- Benship Hungary Ltd.
- DDSG Mahart
- CornMill Hungary Ltd.

Centroport Ltd. is located in the port of Dunaújváros, Pest County, their core activity is agricultural logistics transporting agricultural products mostly on water as much as possible.

Activity: agro-logistic river/rail/road, transhipments, covered /1600 sqm/ flat grain storage at Dunaújváros.

Grain hopper is able to store 6.300 mto bulk cargo at the same time, with mobile separation walls dividing it into four sections. The matrix technology is computer controlled. The point is that it can be used in road, rail and waterway transport alike.

There are several elemets in the loading technology which are unique in Hungary – and perhaps in Europe.

For instance, a special feature is that – as appeared to the former techniques – the ship does not need to be shifted, a bridge structure is moving on the wharf parallel to the ship, and load the holds continuously.

Loading rate 200 mto phrs, for shipping is 3.000 mto pwwd shinc, which is 1.000 mto per shifts.

And on the top of all, in the end it prints a verified scales ticket about the weight of goods. The efficiency of solutions is well shown by the fact at present delivery is possible by road even if it is raining.

The technical capacity offered by Centroport is 300.000 mto yearly, handling about 10% of the total Hungarian grain export in better times.

Euro Bevrachting Germany AG is a supplier for the international food industry and service provider for global trading companies. Operating from the North Sea to the Black Sea, the company carries bulk cargo products such as soya, maize, rapeseed, barley, wheat, brewing malt and sunflower seeds for its customers, as well as coal, iron ores and steel products. They also manage project cargos in case of demand for transformers, wind power stations, constructions parts or reactors.

Headquarter of IKR Agrár Ltd. is located in between Bábolna and Nagyigmánd, quite close, approx. 20 kilometres away from Komarom. Carrying wheat, corn, barley, sunflower, rapeseed, other cereals (triticale, rye, oat, soya). Purchased harvested crops are being sold in inland and export markets as well for manufacturing industry.

Benship Hungary Ltd. has been operating in Budapest since 2014 building on its decades of experience on different modes of transportation. In accordance with the requirements of the client, Benship develops the most suitable mode and route for safe delivery of goods to the destination, choosing the most advantageous tools and technology. In line with the contractual terms of trade, they organize a combined transport chain with several modes of transport. Their aim is providing full, high quality and cost-effective services for their clients. Their core activity includes transportation from the dispatching point to the destination by various modes of transport, supplementary services, including inland waterway, port handling (loading, unloading, fixing, intermediate storage). Their partners serve on road, railway, river, sea, such as brokers, distributers, port agencies, insurance companies. On IWW, the company carries steel products, chemicals, heavy cereals, forage, oilseeds, food and beverages, industrial raw materials, besides many more on other ways of transportation.

DDSG Mahart, being successor of the former Hungarian freight transportation company has great experiences too. As a member of the Austrian First DDSG GmbH, it has more than 180 years of experience and wide range of international partnership on IWW cargo transportation.

Its fleet contains 240 vessels, transporting 330.000 tons annually from Mannheim to Constanta.

CornMill Hungary Ltd. is located in Nagyigmánd, 20 km-s away from the port of Komarom. The corn processing and grain trading company produces corn beer-grits, corn extruder grits, coarse-grained breeze, corn culinary flour, corn flake flour, corn germ, hominy feed and corn feed flake-flour. They are dealing with wholesale of agricultural products and commodities as well. Processing capacity of the company reaches 60.000 tons of corn annually.

4.5.8 Potential port users

Due to the main profile of the port of Komarom, which is bulk cargo, companies transporting cereals and fertilizer are the potential port users. Vandamme Hungária Ltd., member of the international Group Vandamme, for instance, has been operating in Komarom since 2008. The Group produces oil from corn and soya, uses forage and pellets. Both their Belgian and Hungarian factories are located by rivers in order to use an environment-friendly mode of transportation for bulk products. They have been using the port of Komarom for transhipping, but other companies, located further from the city, would appreciate if the port had storage capacities.

4.5.9 Planned industrial and economic developments in the port's hinterland

BYD opened its first European electric bus-manufacturing plant in Komarom in April 2017[3]. During the period 2015-2018 the Chinese corporation is investing EUR 20 million (approx. HUF 6.2 billion) into the new factory. Currently, Komarom plant has 32 employees, 68% of them are factory workers, but the number of employees will expand to 300 who will create 400 electric buses annually to be exported into continental European markets.

In the beginning, electric buses for long-distance transportation purpose will be manufactured in the plant, but in the near future, portfolio will be expanded by other products, such as electric forklift trucks and commercial vehicles. The factory consists of 5 buildings: a central office, a battery testing and maintenance centre, a quality control and water leakage test facility, a bus and truck assembly hall and a vehicle painting plant.

According to the plans, Hungarian factory will also produce the chassis of buses that will be assembled under the BYD-ADL partnership in the UK and BYD's recently announced factory in France. Approximately 40 vehicles will be expected in the new factory by the end of 2017. The company's official name is BYD Electric Bus and Truck Hungary Ltd.

4.5.10 Cargo statistics

Due to lack of information on cargo statistics from the previous years in the port of Komarom, the data was available only for 2016. In the year of 2016, the main types of goods transhipped, unloaded or loaded were different kind of cereals and metal products. To be exact, 8548 tons

[3] *Source:* http://www.autoblog.hu/zold_auto/184145/ downloaded: 21.07.2017

of soybeans, 8217 tons of soy pellets, 6609 tons of potash, 25536 tons of CAN, and 4514 tons of iron ores were un-uploaded in the port.

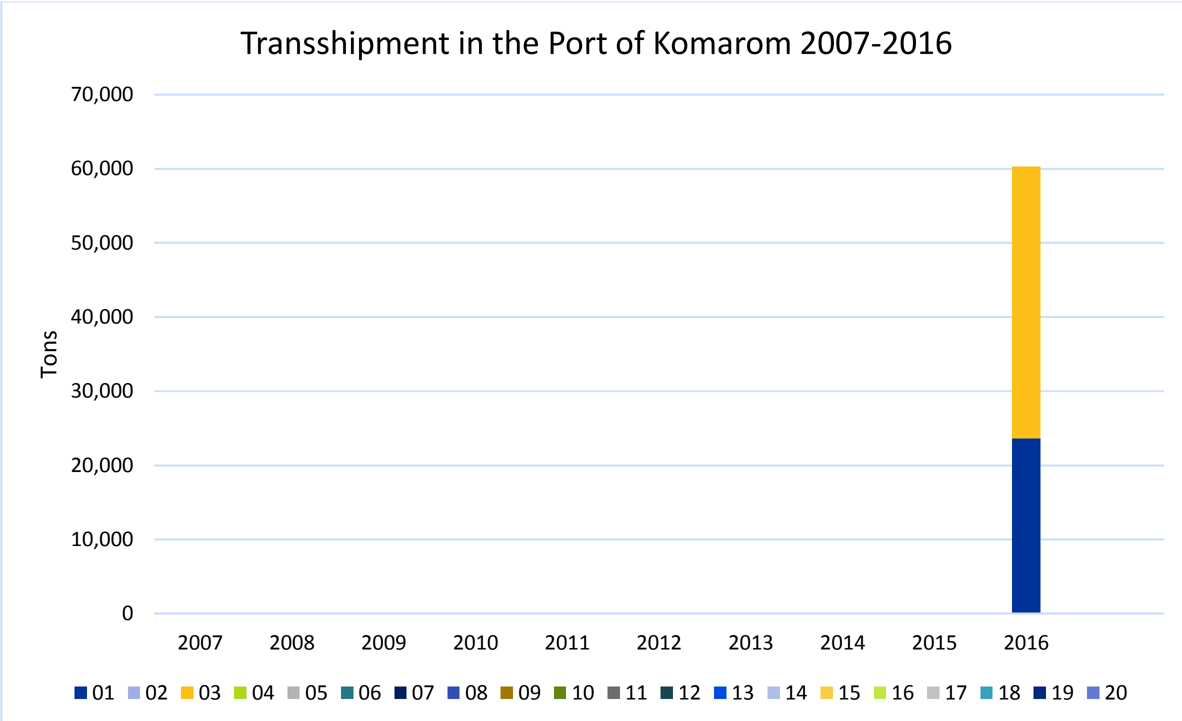

Figure 20: Transshipment statistics in the Port of Komarom

(Source: iC consulenten, based on data provided by HFIP)

4.6 Port of Budapest

4.6.1 Position

Freeport of Budapest is located in Csepel Island, the south part of the capital of Hungary. Csepel is the 21st district of Budapest. The address of MAHART Freeport Plc, the port land and infrastructure owner organization, is 1211 Budapest, Weiss Manfréd (formerly: Szabadkikötő) Road 5. The port is located in the Danube-Mainland Rhine waterway on the Danube section crossing the continent northwest to south-east in the inland waterways of Europe, at the 1.640 km of riverbank.

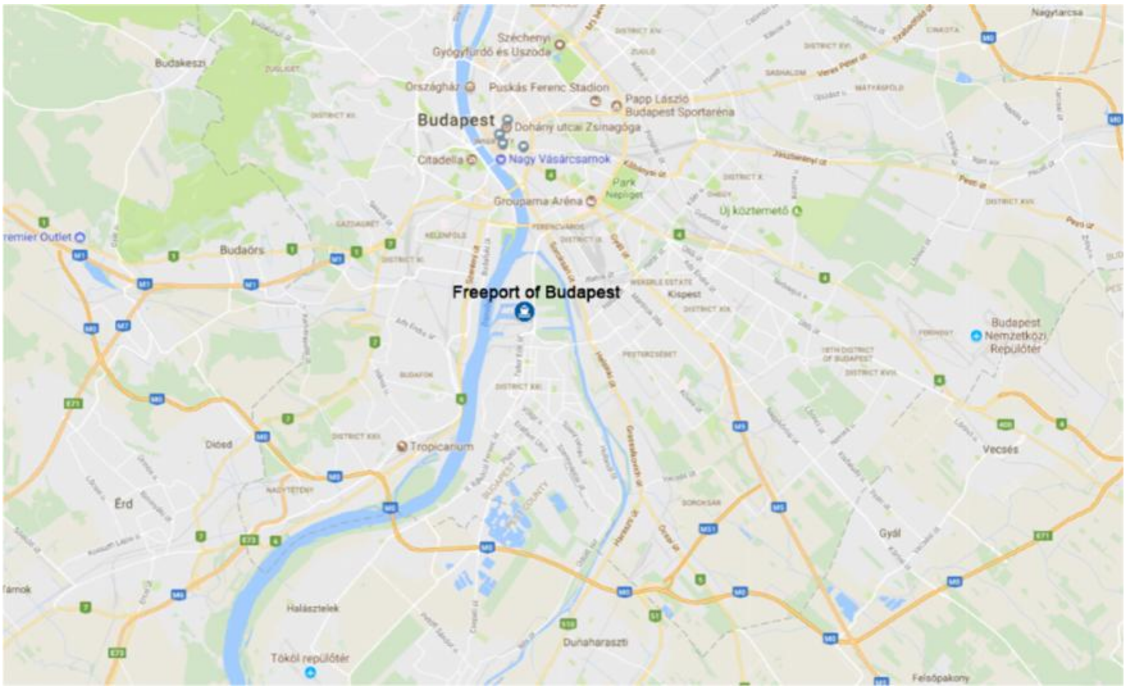

Figure 21: Location of the Port of Budapest

(Source: HFIP, via Google Maps, 2017)

4.6.2 Ownership, administration (governance) and operation

MAHART Freeport Plc., the owner of the port land and its infrastructure (quays, basins, berths, etc.) is a 100% state owned company owned by the Hungarian National Asset Management Inc. The port authority, responsible for port governance and port administration, is Freeport of Budapest Logistics Ltd. (hereinafter: BSZL). BSZL's legal successor called MAHART Freeport Corp. was set up on 1 September 2005. MAHART Freeport provides the right to BSZL to operate the Freeport of Budapest for 75 years within the pre-privatization and operation contract. This contract includes the possession and use of property owned by MAHART Freeport.

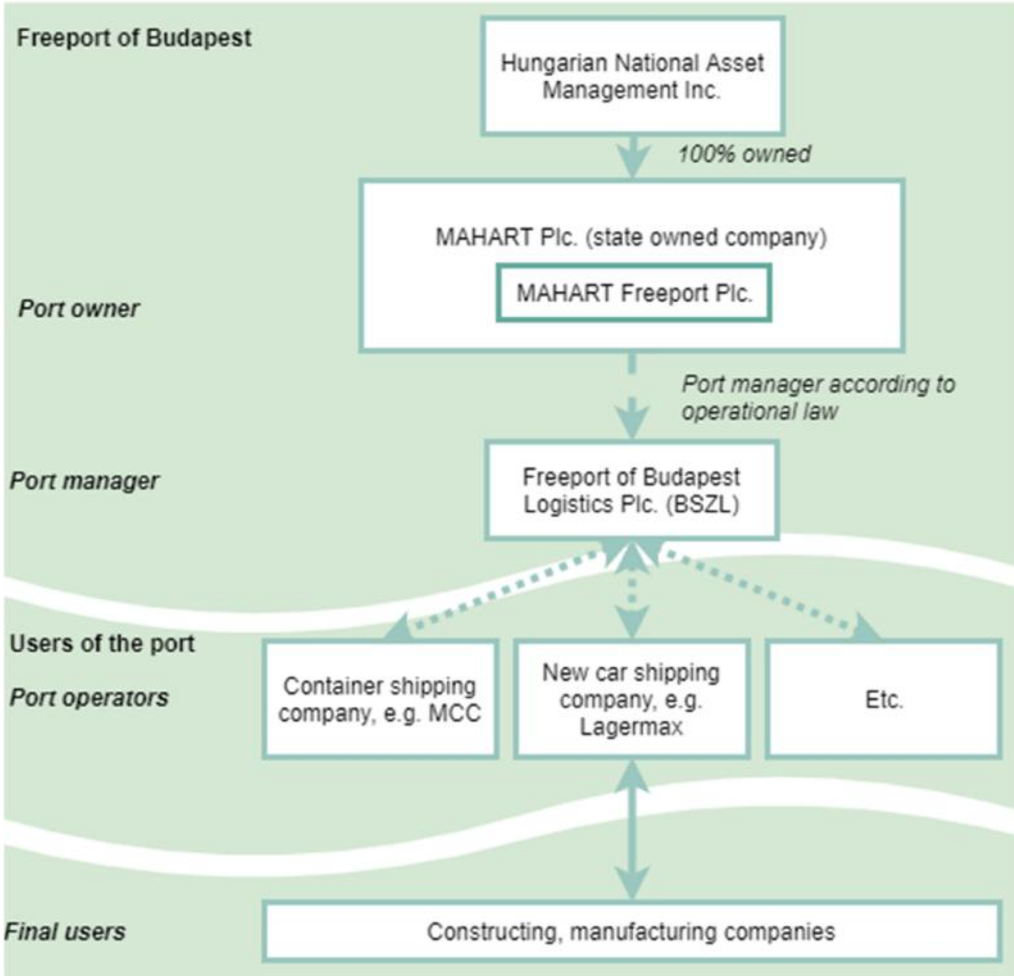

Figure 22: The organizational structure of port owner, port manager and port operators

(Source: HFIP)

The Freeport is operated by public and private companies running their businesses in the area of the port, among them the most important ones are:

- ArcelorMittal Distribution Hungary Ltd.
- Lagermax Dunalogisztikai Ltd.
- MAHART Container Centre Ltd. (M.C.C.)
- Ghibili Ltd.
- MASPED PORT Logistics Centre
- Ferroport Ltd.
- MAHART Gabonatárház Kft. (Grain warehouse Ltd.)

4.6.3 Infrastructure assessment

On the total area of the freeport, i.e. 152 ha within 42 ha of free space for development, there are open shore and 3 basin type ports as well. In terms of loading capacity, there hasn't been great improvements for years. Capacities like cargo handling or throughput capacity are stagnating or slowly increasing. Number and level of other infrastructural elements, such as bulk terminals, break-bulk terminals, gas, oil, chemical terminals, Ro-Ro terminal and ramp, quay-side container terminals without and with rail-road connections, tri-modal terminals, multipurpose terminals, vertical, sloped and undeveloped quays, vessels, bunkering facilities have not changed recently. The reason for this is that the main operational activity is to maintain the current quality of basic infrastructure of the harbour. Partly completed and partly still planned project elements will be described under following subchapters. In general, pavement, road network, storage halls have been constructed recently, but except the biggest cranes, the private companies are the ones filling up the buildings with and using their own equipment and providing their logistic services. As it later on will be told under subchapter on major port users, these major port users have hardly no contribution to the maintenance and development of basic infrastructure. On the other hand, leaseholders' everyday demands are above long-term investments in the hierarchy, meaning there is no need for more cranes, but maintaining background for current capacities.

4.6.4 Special infrastructure regarding surface pavement & drainage of rain water

Freeport of Budapest makes efforts to introduce and acquire green energy and to become as environmentally sustainable as possible. However, there are not enough rain water, biomass, used hot water to utilize, and unfortunately there are budgetary issues even with possible solar cells. Therefore, only solar panels have been installed.

To reduce pollution emission, as it later on will be told under Section 5.6, an LNG terminal will be settled in the port, where fuel extraction and storage will be accessible.

4.6.5 Hinterland connections (road, rail and IWW)

As the Freeport of Budapest is located in Csepel, on the edge of the metropolitan area, and is Hungary's second largest port and logistic centre, its hinterland is actually the whole country. There are important international corridors (TEN-T corridors) going through Hungary both east-west and north-south directions.

Csepel Island is surrounded by the River Danube. Freeport is located on its north part, accessible on water on the right branch. From the direction of Austria and Slovakia, it is the third freight port among the bigger ones in Hungary, after Győr-Gönyű and Komárom. On the way to the south, the biggest ports are in Dunaújváros and Baja on the River Danube. Close to the border of Serbia, Port of Mohács will be constructed and developed in the upcoming years to provide high-end services and become an excellent logistic centre as the first/last checkpoint in the country for vessels coming from/going to the direction of Constance.

The Freeport and Csepel Island are linked into the national railway networks by the Gubacsi bridge located on the north-eastern part of the island. On railway, Hungary has 9 border crossing points towards Slovakia, 6 to Austria, 1 to Slovenia, 3 to Croatia, 2 to Serbia, 5 to Romania and 2 to Ukraine. Besides there are 16 organizer stations in the country.

As regards road connections, Freeport is accessible on highways M1 from Austria, M7 from Croatia, Slovenia, M6 from the south, M5 from Serbia, Romania and M3 from the east, using the ring-road, M0 as well. Trucks can approach the port from the highways via either M0 – M51 – Ócsai Road/Grassalkovics Road/Helsinki Road (on the Pest side by the river) – Gubacsi bridge, or M0 – II. Rákóczi Ferenc Road (through Csepel downtown) – Weiss Manfréd Road, or from the city through Kvassay Jenő Bridge.

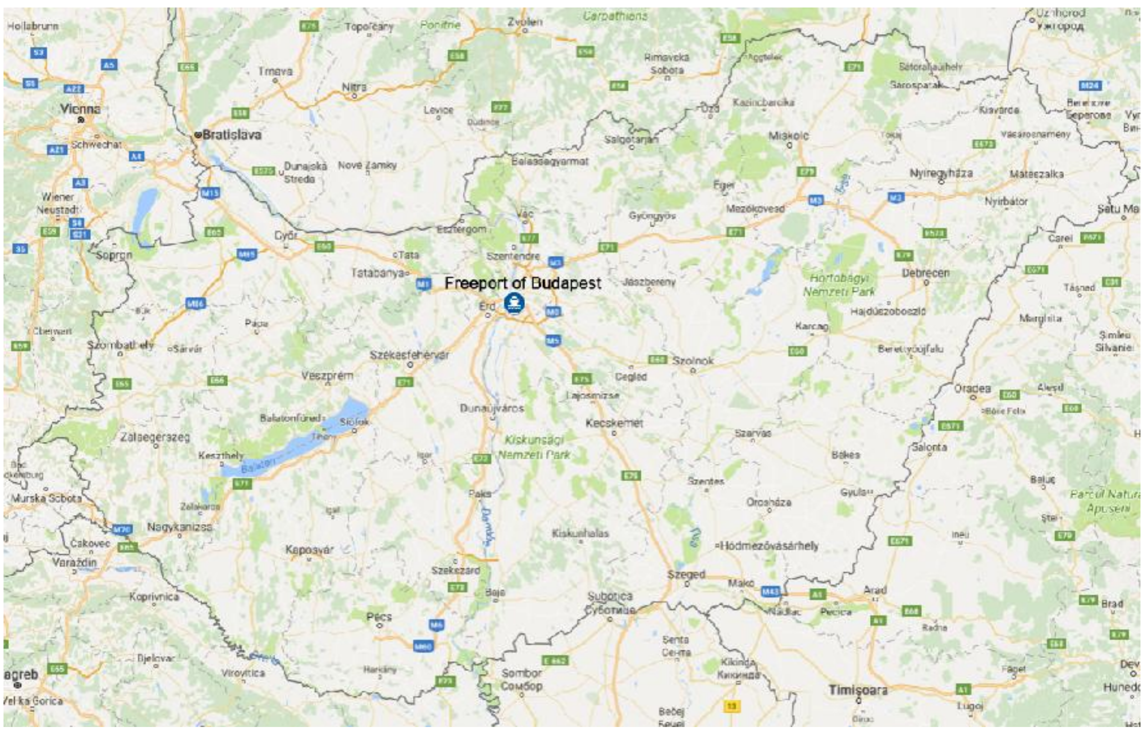

Figure 23: Accessibility of the Freeport of Budapest on roads

(Source: HFIP via Google Maps, 2017)

4.6.6 Hinterland (economic situation in the port's hinterland)

The Hungarian economy switched to a growth path from 2013 that has kept going in early 2017 too. According to the most recent raw (unadjusted) data, Hungary's economy had a spectacular start in the first quarter of 2017. GDP increased by 4.2% compared to the previous year, which is the greatest enlargement in nearly three years. As seasonally adjusted and calendar-adjusted data tell, economic performance grew by 3.8% compared to the same period of the previous year, and 1.3% compared to the previous quarter.

Gross fixed capital formation, which grew by 28%, has largely contributed to economic growth in Q1 2017. The share of consumption to GDP was 16.4%, 3.1 percentage points higher than a year earlier. More than three quarters of the gross fixed capital formation in the national economy grew by 34% compared to the previous year's low base. Strong growth has affected almost the entire national economy. Besides boosting the capacity building of businesses, the real implementation of projects launched in the EU budget period 2014-2020 also gained momentum. Investments have been expanded in each of the key areas (manufacturing, real estate, and transportation, warehousing).

In Q1 2017, foreign trade also positively supported the growth of GDP volume. The volume of exports was 9.4, imports exceeded the values of the same period of the previous year by 10%. Growth in foreign trade was boosted by expanding industrial production and household consumption. Foreign trade in goods and services has expanded in both directions. Despite a slight foreign trade balance of HUF 88 billion deteriorating compared to the same period a year, Hungary is still characterized by a high level of economic openness: the HUF 759 billion foreign trade surplus is equal to 9.2% of GDP.

On production side, industry and market based services have increased, meanwhile agriculture has decreased the growth of economic performance.

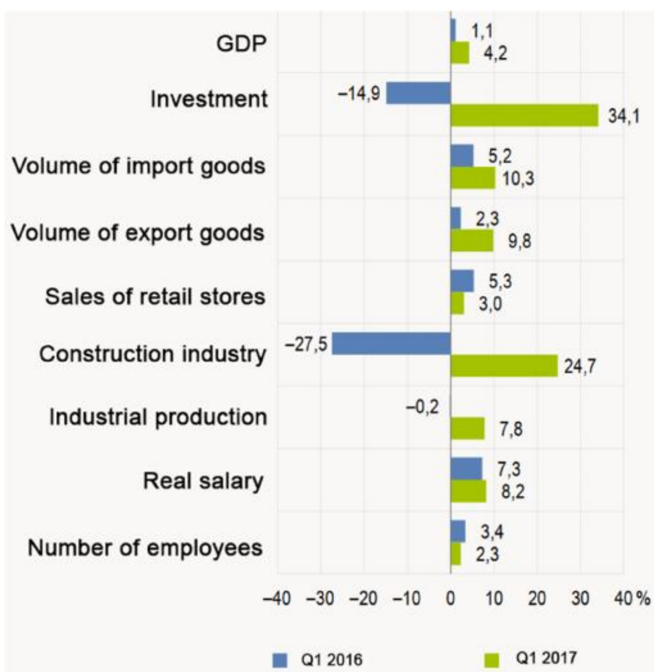

Figure 24: Typical economical indexes' changes in Hungary

(Source: HFIP, via KSH – Hungarian Central Statistical Office)

On production side, industry and market based services have increased, meanwhile agriculture has decreased the growth of economic performance.

In January-April 2017, according to the first estimate, export sales amounted to EUR 33.1 billion, 9.1% higher than in the first four months of 2016. Imports amounted to EUR 29.8 billion, 11% more than a year earlier. Growth rates are the most significant over the last six years. Hungary's foreign trade closed the January-April period with a surplus of EUR 3.4 billion, which is a deterioration of EUR 147 million from the previous year.

According to the data processed in Q1 2017, the volume of foreign trade increased by 9.8% in exports and by 10.3% in imports compared to the same period of 2016. The price level in HUF terms increased 1.7% in exports and 3.0% in imports from the period January-March 2016. The exchange ratio has been unfavourable in the first three months of 2017, with a deterioration of 1.3% in the context of the worsening of energy sources. Forint was 0.9% stronger compering to euro and 2.5% weaker compared to US dollar in January 2017 than it was in 2016.

4.6.7 Major port users

As mentioned above, operators of the Freeport are those private and public companies that run their businesses at the harbour. BSZL simply coordinates among them, and help them at hiring labour, supporting loading and other logistic companies to meet each other and to improve their network, facilities, and economical positions.

ArcelorMittal Distribution Hungary Ltd. is among the largest steel companies of the world, having 310.000 employees in more than 60 countries. It has led the consolidation of the world steel industry and ranks as one of the only truly global steelmaker. It is the leader in all major global markets including automotive, construction, household appliances and packaging. The company leads in R&D as well, holding sizeable captive supplies of raw materials and operates extensive distribution networks. ArcelorMittal holds the operational rights and access for the properties of the Freeport financed by the long-term cooperation of the port and the company. The company has been operating in the port since 2007, before that it had permanent and temporary warehouses in several settlements in Hungary. The company operated in the port area of nearly 0.4 ha, with its covered and free warehouse. ArcelorMittal purchased the warehouse hall in 2013 by holding its pre-emptive right.

Ferroport Ltd., established in 1988, is a joint subsidiary of MAHART and M. Preymesser GmbH. The company is active in the Freeport, operating in about 4.5 ha that is its own area, not leasing it as almost all other companies are. Their speciality is that their 3800 m2 hall provides sheltered/covered storage and storage facilities for products arriving on road, rail, IWW. Logistic activity carried out by the company signifies river transhipment of metallurgical products and cereals, as well as goods handling in their 9000 m2 warehouse.

The subsidiary of an Austrian company, Lagermax Dunalogisztikai Ltd., having a Central-Eastern European focus, has been operating in Hungary since 1990. Their core activity is freight transport. They have 250 employees. Working with wide range of clients based on long term contracts led them to have deep partnership with companies such as Porsche Hungária, Ford, Toyota. Furthermore, the company has Ukrainian, Romanian and Serbian partners too. Their headquarter is in Budaörs, but they also have locations in Esztergom and since 1998, at the Csepel Freeport.

MAHART Container Centre Ltd. (M.C.C.) is a container terminal operating in the Freeport of Budapest having a great advantage of tri-modal services availability. M.C.C. has been operating and providing its own terminals independently for all clients since 1998. M.C.C. has been growing since the 90s, it has multiplied its container traffic, requiring a continuous improvement of infrastructure and equipment. M.C.C. manages loading for its and BSZL's partners.

MAHART Gabonatárház Ltd. (Grain Warehouse) is a subsidiary of BSZL. With a duty-free zone in the port, modern loading and unloading equipment, Hungary could become more involved into Danube's and international trade chains. The main profile of the company is grain storage and public warehousing. They undertake full customs clearance for their partners. Their usable warehouse space is 3.3 ha suitable for storing 30.000 tons of wheat, but typically does not store more that 22-25 thousand tons. Within the physical facilities of the repository, commodity separations are undertaken by the buyer's request. Grain warehouse operates an overburdened transhipment base of several hundred thousand tons per year, the Agroterminatum, established in 1997, suitable for the transhipment of agricultural products intended mainly for export. It also makes conducting direct transhipment between river and land transport equipment possible.

The currently 100% Hungarian owned Ghibili Ltd., established in 1996, provides full-scale logistics service including Italian-related transportation from the beginning, warehouse services since 1998 and a VAT warehouse since 2004. Within their inland transportation the company organizes the distribution from warehouses to every corner of Hungary.

Being a member of MASPED Group, MASPED PORT Logistics Centre is a leading supraregional distributor. The member companies provide their Hungarian and foreign customers high-end services in all branches of shipping forwarding and related fields of activities. The company has been operating in the Freeport since 2005, currently providing their services at two warehouses, utilizing the advantages of bi-modal connections to railway and waterways.

Good practices of managing partnerships and workflows among cargo-handling companies and others responsible for heavy goods, cars and further logistic services have been developed in the Freeport of Budapest. Hence, the frequency of services of new car cargo is stable, while high or heavy goods are managed by project cargos. At this time, companies managing heavy goods bring their own huge crane to the port for certain projects.

4.6.8 Potential port users

There is no written strategy telling how exactly port managers, operators and authorities shall create new businesses and establish new partnerships to develop the life of Freeport of Budapest. Still, what could convince new entrants, are current companies trying to support each other and cooperate by providing their services to each other and even potential market players as well.

4.6.9 Planned industrial and economic developments in the port's hinterland

In March 2017, Ministry of Foreign Affairs and Trade pressed[4] that the Hungarian subsidiary of German car parts manufacturer, ZF Friedrichshafen AG (ZF Hungária) is investing HUF 31 billion in Eger, Northern-Hungary. In the frame of that, a new gear-shift plant will be installed by summer of 2018. Thanks to the development, 770 new jobs will be created besides the current thousand. By the eight-speed automatic automobile-industrial investment, Hungary's export volume will be boosted by HUF 200 billion annually.

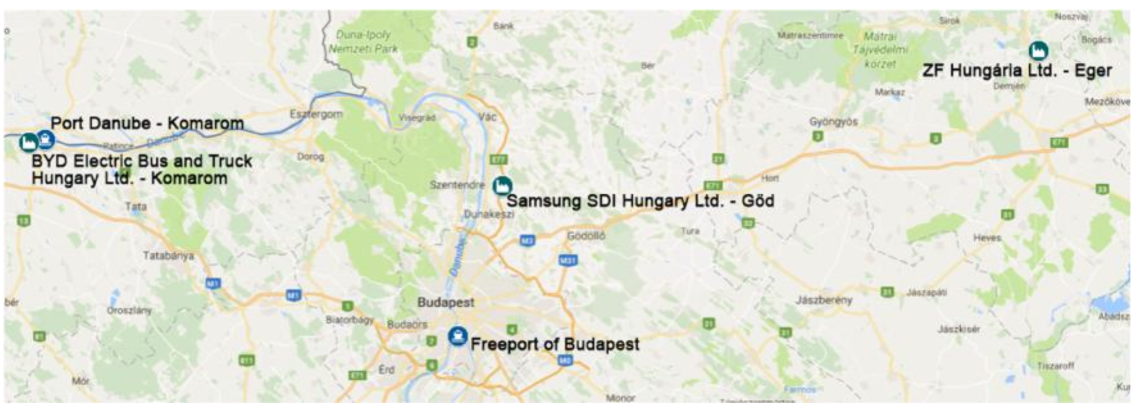

Figure 25: Planned industrial developments and ports of Komarom and Budapest

(Source: HFIP, via Google Maps, 2017)

One of the largest TNCs, Samsung's battery manufacturing division will install a new factory in Göd, where production begins in the second half of 2018. Samsung SDI plans to invest $ 358 million in the facility (approx. HUF 100 billion). The plant in Göd will be as big as 330.000 m2.

The department is working together with such partners as BMW, thus, Samsung batteries are there in the i3 models among others. Location was justified by the fact that most European manufacturers are relatively close to Hungary. Hence, the company hopes to reduce shipping costs and be able to keep pace with the increasing demands of car manufacturers.

[4] *Source:* https://bbj.hu/business/zf-hungaria-to-invest-huf-31-bln-in-eger_130677 downloaded: 21.07.2017

4.6.10 Cargo statistics

According to data available since 2009 till the previous year of 2016, the most dominant types of goods transhipped in the Freeport of Budapest in the following order were

(1) coal and petroleum
(2) agricultural products, especially cereals, grain in bulk
(3) basic metals, metal products, iron and steel products
(4) secondary raw materials; municipal wastes and other wastes
(5) meteal ores and other mining products
(6) transport equipment, especially automobile industry products
(7) other goods n.e.c.
(8) equipment and material utilized in the transport of goods

After a peak in 2010, since 2011, amounts transhipped has been growing almost continuously as the total volume is concerned. In terms of commodities, values are more diversified.

There were absolutely no textile products, household goods, unidentifiable goods or mail and parcels transhipped in the port.

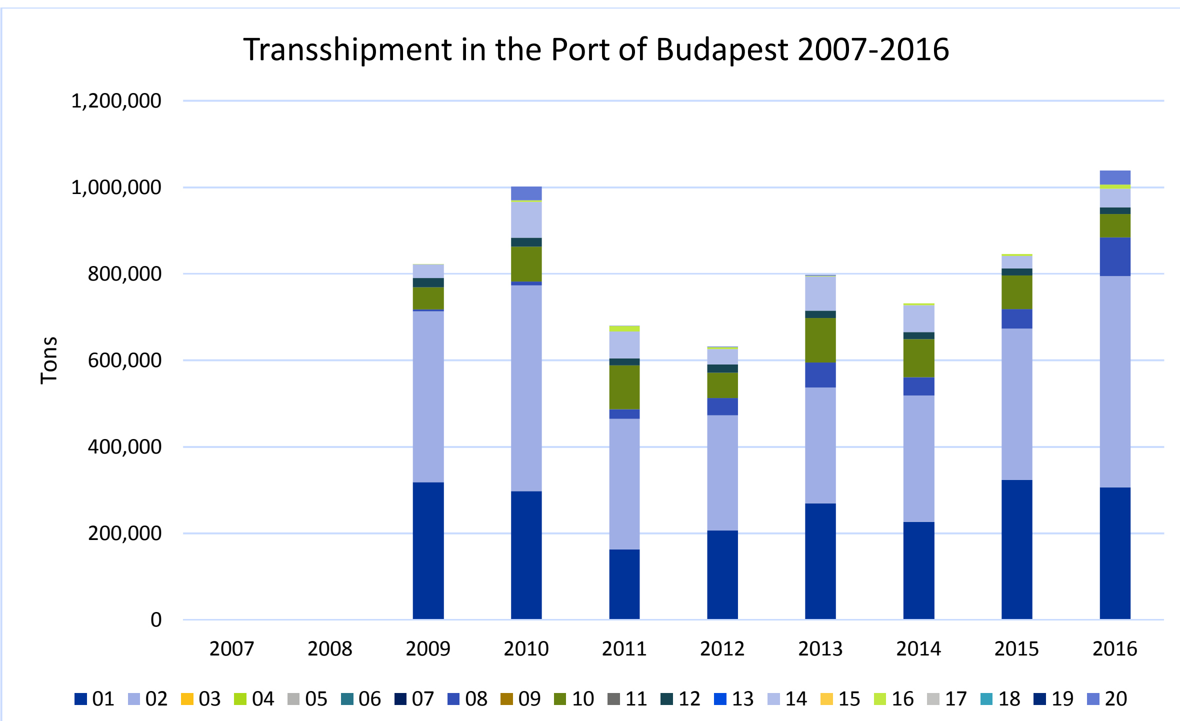

Figure 26: Transshipment statistics in the Port of Budapest

(Source: iC consulenten, based on data provided by HFIP)

However, the Freeport of Budapest is the second largest port of Hungary, it is still specified to the above-mentioned 6-8 types of goods – according to the data – instead of carrying almost every type of cargos, and it is hardly depending on the current infrastructure and the habits of logistic companies.

4.7 Port of Slavonski Brod

4.7.1 Position

The port of Slavonski Brod, with its port area, is based on the left bank of the river Sava on river km 364+000 and river km 362+200. It is approx. 4 km southeast of the town of Slavonski Brod and beside an existing industrial area. This port has international importance. It is located on the border of Republic of Croatia and Bosnia & Herzegovina, on the X transport corridor and in close vicinity of the junction of the X and Vc transport corridors.

The port area is at present connected with the international corridors through existing road and railroad infrastructure. Due to its geographical location this port has great capacities to be developed as an intermodal port centre.

4.7.2 Ownership, administration (governance) and operation

The land and the infrastructure in the Port of Slavonski Brod is owned by the Republic of Croatia.

Currently, the only operator of the port is the Port Authority of Slavonski Brod. The Port Authority in Slavonski Brod, as a public institution is in charge of management and development of ports and piers on the river of Sava from 207-467 river km. The Port Slavonski Brod is founded by the Government of the Republic of Croatia and was declared as the port of high importance. It finances the operation costs through revenues gained from port operations as well as land and building lease contracts. Namely, according to the latest legislative changes (Act on Navigation and Inland Ports) from 2014, the Port Authority fulfils legal requirements for autonomous service provision within the port. Port Authority Slavonski Brod will not establish a legal entity whose purpose would be to operate the port infrastructure, but is open to the option of giving built infrastructure under concession whereby ports still remains open to the public.

As infrastructure manager Port Authority of Slavonski Brod has the responsibility for maintaining transport infrastructure in the port of Slavonski Brod and secures the operation of the port facilities and manages them.

The construction and provision of all major investments in the infrastructure and facilities remains the responsibility of the Port Authority of Slavonski Brod.

4.7.3 Infrastructure assessment

Currently the port consists of general cargo terminal that is built in 2006. Vertical bank in the length of 120 m and width of 12 m and quay 3 (built in 2004) are operational. Within the quay 3 manipulation area of approx. 2.000 m^2 is functional and used for transshipment of freight. Two containers are placed as temporary offices for the staff of port of Slavonski Brod. The port area is connected to the railway network from the west and over several tracks serves commercial and industrial facilities within and outside the port area. The river bank, planned for the construction of the port, nowadays is used for anchoring.

The port has a total surface area of 90 ha, while 27 ha are available for port development. It is an open shore type port and has no port basins. Maximum available draft is 2.5 meters. Its maximum designed cargo handling capacity is 1.500.000 tons/year, after completion of the project "Infrastructure upgrading and development of terminals and supporting facilities in the port of Slavonski Brod". It is expected to be finished at the end of 2019. Currently, the port has one multipurpose terminal and one oil terminal. Currently under construction, the port will have 1 tri-modal terminal and 2 multipurpose terminals by the end of 2019.

Following the completion of the aforementioned project, the port will have a possibility to handle full block trains within the port area and along the quay wall. Currently, the port has only 120 m of the quay wall, all vertical quay. Length of undeveloped quay reaches 230 m and is available for further port development.

The port has one single-track entrance to the port, with 120 m of the rail tracks along the quay and 1737 m in the rest of the port area. Upon completion of the project "Infrastructure upgrading and development of terminals and supporting facilities in the port of Slavonski Brod", the port will have 610 m of rail tracks along the quay and an additional 1300 m of the railway tracks in the port area.

Currently, the port has 4 road entrances with the total of 8 lanes, while the completion of the on-going project will provide additional 3 road entrances with 6 additional lanes.

The port offers 270.000 m^2 of storage space, and by 2019 it will have an additional storage capacity of 12.000 m^3 for liquid cargoes and 15.000 TEU for container storage.

Bunkering is not available in the port. No plans for supply of alternative clean fuels (such as LNG) have been reported. The port also plans waste collection facilities, as well as facilities for collection of oily wastes, oily waters, sludge and bilge waters. Shore-side power supply for vessels is not available.

4.7.4 Special infrastructure regarding surface pavement & drainage of rain water

No special requirements exist when this type of infrastructure is concerned.

4.7.5 Hinterland connections (road, rail and IWW)

The Port of Slavonski Brod is located on the X transport corridor and in close vicinity of the junction of the X (Ljubljana – Zagreb – Belgrade – Thessaloniki) and Vc (Budapest – Osijek – Slavonski Brod – Sarajevo – Ploče) transport corridors. The port area is at present connected with the international corridors through existing road and railroad infrastructure. Due to its geographical location, this port has great capacities to be developed as an intermodal port centre.

The port is located on Sava River that is included in the Rhine-Danube Core Network Corridor. The Sava River is the only waterway of the Rhine-Danube Corridor that is not classified at least as class V waterways. The Sava River only partly complies with class IV 316.50 km, some of its navigable length shows class III 277.10 km, which is planned to be upgraded. The execution of related investments on the Sava waterways implies infrastructural upgrades in the ports due to the expected changes of the vessels length and tonnage.

4.7.6 Hinterland (economic situation in the port's hinterland)

According to the port's available market investigation, the following targets are set the immediate and near hinterland of the Port of Slavonski Brod:

- Town of Slavonski Brod, Brod-Posavina County and neighboring counties
- Area which reaches up to 100 km from the port of Slavonski Brod
- Selected area counts roughly 25% of the Croatian population
- Focus on companies located closer to Slavonski Brod

From the analysis of the current state of the economy, and the conclusions of the analysis carried out in the framework of the document Strategy of Positioning of the Port of Slavonski Brod made by the Faculty of Economics of the University of Rijeka, the following assumptions related to defining the demand for the Port of Slavonski Brod on 2nd gravitation area can be selected:

- The most important sectors in the Brod - Posavina County is manufacturing (metal 53,97%, 19.69% wood, food 8.97%); with a share in total revenues of 36,8%.

4.7.7 Major port users

Currently, the port signed concession contracts with following companies for cca 180.000 m2 of the total port area:

- Croduxenergetika d.o.o (building of thermal energy plant)
- Croduxplin d.o.o (for building of facility for production of bioethanol).

The port Authority also received LOI from Optima group, registered for production of oil and oil derives, interested for storage and transport of crude oil and derives information obtained from the Port Authority of Slavonski Brod related to inputs/outputs of specified facilities.

Based on the planned capacity of bioethanol production from 200,000 t/year, the total annual transhipment in the port area of Slavonski Brod is planned as follows:

- Supply of raw materials - production corn about 600.000 tonnes/year,
- Delivery of the various production components about 50.000 tonnes/year,
- Delivery of liquid bioethanol around 200.000 t/year,
- Delivery of DDGS (the leftovers from grinding and production) around 204.000 t/year. The term for the realization of the construction of the bio-ethanol plant is end of 2019/ beginning of 2020.

This investment is realistically to be expected, since the subject company already signed a long-term concession contract for lease of land in the zone. Of the total potential of approx. 1 million tons of various cargo per year, we used 50% of this quantity for a realistic scenario in the first year of operation (2020), i.e. 0,5 million tons of various freight during one year.

Other operators plan to annually transport:

- Up to 2 million tons of oil,
- Up to 3 million tonnes of cereals, sugar and bio fuels, and products of metal industry and other goods.

4.7.8 Potential port users

The potential in the metal processing industry:

There are three prevailing companies among the total of 81, based on their overall revenue. The company Đuro Đaković (special vehicles) specijalna vozila d.d. with corporate seat in Slavonski Brod makes 80% of the overall revenue in production of other means of transport (manufacturing of rail locomotives and other track vehicles, manufacturing of combat and armoured combat vehicles and other purpose vehicles) together with the other two large companies AD Plastik and P.P.C. Buzet, in this sub- category of the metal processing industry sector in the Republic Croatia.

The company Đuro Đaković

Đuro Đaković Group consists of Đuro Đaković Holding d.d. as the central operating company of the Group, and seven companies in which Đuro Đaković Holding d.d. is the majority owner. Their main groups of products are:

- Transport (Railway Cargo Wagons and production of parts and components for wagons),
- Defense (AMV 8x8 Wheeled Armoured Modular Vehicle, Main Battle Tank Program, RM03 Mine sweeper),
- Industry and energetics (production of process plants and storage tanks for food industry, oil industry, cement industry and power generation).

In order to succeed in this business, the transport communication and traffic network and accessibility is crucial, since the majority of business is based on trade and other countries. In total 79,95% of the overall revenue in 2012 is generated from sales to foreign buyers, so the company Đuro Đaković showed major interest for the services of the future port, because and decrease in transportation costs will make their products more attractive in international markets.

From transport part, the products (mostly wagons) were exported to western Europe lately (few larger contracts were finalized with destinations in France, Switzerland, Germany - recently they signed second contract with the company Ermewa Ferroviaire from France for wagons worth somewhat less than €10 million.

Latest defence programmer was negotiated with Kuwait, some of the pilot modular vehicles were sent to them.

Looking through the reference list for industry and energetics, the products were distributed within Croatia and following countries mostly: BiH, Serbia, Iran, Ukraine, Russia, Romania, Bulgaria i.e. all the countries which are potential destinations by using IWW transport and facilities of Slavonski Brod.

<u>The company Saint Jean Industries</u>

This company opened in 2013 a new built plant in Slavonski Brod for the mechanical part processing of parts of casings of the turbo chargers for car engines. The entire Saint Jean Industries group employs 1.800 workers and earned revenues of 210 million € in 2012. Their main customers are AUDI-VW Group, PSA, Honda, GM, Hyunday-Kia, Renault, Ford, BMW, Volvo, Aston Martin and in Croatia parts for Peugeot-Citroen, Renault, Honda, Mitsubishi, Poma, Alstom are manufactured. In accordance with the business plans of the company, the planned volume of turnover to be achieved is 30 million € per year in automobile parts to be exported to the European and world market. Export chances would be increased tremendously through large and heavy components transport by ship via the General Cargo Terminal.

The possibility for the port Slavonski Brod can be seen from many angles from metal processing industry:

- Usage of ro-la terminal for railway cargo wagon program for western Europe.
- Usage of IWW mode for transport of defence equipment towards Black sea and Middle east countries as well as the distribution of oil boilers, tanks and mills towards Romania, Bulgaria, Russia, Ukraine etc.
- Usage of IWW mode for transportation of inputs for steel and metal production from Ukraine, Russia etc.
- Usage of rail/ro-la terminal and IWW transport mode to Danube and forwards for distribution of steel and metal parts for the auto industry towards motor assembly factories around the world (Germany (rail), Romania, Slovakia, Russia, etc.).

<u>The potential in the energy sector</u>

Croatia belongs to the group of countries that are able to have a part of their needs for hydrocarbons covered from their own production. Hydrocarbon production in the Pannonian basin began in the 1950s and so far discovered 40 oil and 25 gas fields were discovered. About 700,000 tons of crude oil is produced annually, which is then further processed into petroleum products and used for energy production. The main geothermal resources are located in the Pannonian region of Croatia, with great options for their exploitation.

Taking into account the area that is proposed by the Republic of Croatia for the exploration and exploitation of hydrocarbons, and the position of the Port of Slavonski Brod, the potential for positioning of this region as a logistics centre for the exploration and exploitation of hydrocarbons on the continent is evident, especially following up on the recently established model for the Port of Ploče (Adriatic Sea). The role of the Port in Slavonski Brod arises from its geographic location, existing infrastructure and plans for its further development, as well as the existing capacities and interests of businesses for operations in the port area (the expected duration of contracts with the selected businesses in 30 years, on average).

It is important to note as potential advantage the proximity of Bosanski Brod Refinery in Bosnia and Herzegovina.

4.7.9 Planned industrial and economic developments in the port's hinterland

Based on the analysis of the planned economic developments in the port's hinterland, the following cargoes can be identified as further potential:

Containers - due to new infrastructure (cargo terminal, RO-LA terminal, repair workshop for containers and loading/unloading equipment) , increasing % of container transport in the world's trade and types of goods identified as potential from the catchment area, the it is projected 100.000 tons of containers in the medium scenario. For reference, the same value was estimated within the Port master plan from 2002.

Raw material and bioethanol -potential of the plant is around 1 million tons of raw material and bioethanol yearly. For the medium case scenario, we projected 50% of the plant potential defined by the investor

Crude oil as a potential from the Posavina basin (200.000 tons what makes cca 29% of the total production from the Posavina basin is projected to be transported through port Slavonski Brod) and from abroad (other transport operators) . The projection in this phase includes only a small part (300.000 tons) of the maximum projected amount of crude oil

Sand and gravel - in a medium scenario a quantity of 200.000 per year has been projected, more than currently is transported through the port, but still far from the pre-war quantities. The reason of the decrease in transport of sand and gravel in the past years is the reflection of a decrease in construction activities in general and the lack of investments during the market crisis, from which crisis Croatia is slowly recovering.

Large components - 25.000 tons of large components are planned to be transported through the port as a result of the need from side of mainly company Đuro Đaković, but also as an attraction of percentage of transit and international transport in this field.

-Steel and metal products - the amount of 150.000 tons a year in the medium case scenario is projected as a result of market analysis and demand for transportation of this type of goods from the hinterland (input materials for Đuro Đaković and Saint Jean industries) as well as attraction of percentage of transit and international transport - cca 3%)

The forecasted amounts of cargo are in correlation with the forecasts from the Master plan (2002) and the Pre-Feasibility Study for Rehabilitation and Development of the Sava River Waterway (2007) for medium scenario. The structure of goods differs from these sources, since the situation in the impact area changed (signed concession contracts, new LOI's). However, the same scenarios are developed around the medium one as well as basis for further increase of demand (around 4% yearly).

4.7.10 Cargo statistics

Overview of cargo throughput in the Port of Slavonski Brod is given in Figure 27 below. Virtually all cargo throughput is divided between sand and gravel on the one hand (by far the largest share) and crude oil.

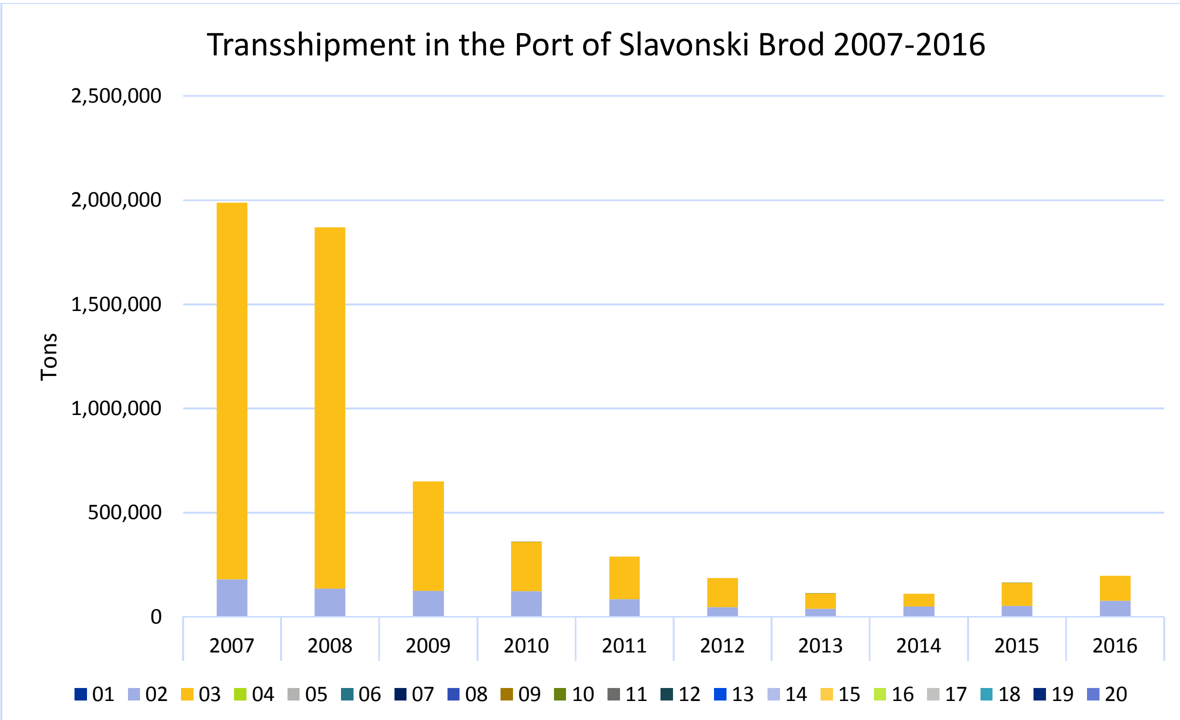

Figure 27: Transhipment statistics in the Port of Slavonski Brod

(Source: iC consulenten, based on data provided by Port Authority Slavonski Brod - PASB)

4.8 Port of Vukovar

4.8.1 Position

Vukovar port is situated on 1335 km of the downstream flow of Danube river, on its right bank. Port stretches towards the East and West and it is 1700m long and 45m wide. The port is very well situated to the main current of the river Danube, which makes it possible for the port to be navigable during the whole year regardless of water level, so even during the period of the lowest water levels of the Danube, the port is operational and active.

4.8.2 Ownership, administration (governance) and operation

Land in the port area is of mixed ownership, as certain land slots are state owned and others are privately owned. Port is governed by the government-founded institution Port Authority Vukovar and is operated by 4 different operators, public and private.

4.8.3 Infrastructure assessment

Total port area currently amounts to 26 ha, with no space for further development within the existing port area. After the completion of a railway infrastructure project, the port area will be reduced to approximately 5,8 ha. Port itself is an open shore type of inland port, with no port basins. It has a maximum draft of 2,6 meters and a cargo handling capacity of 2 million tons per year. No capacities for container handling exist in the port. Port is open 105 hours per week.

The port has 7 terminals in total, out of which one terminal is for bulk cargo, one for grains, one for break-bulk (general) cargo, two liquid cargo terminals, one multipurpose and one for palletized cargo. All terminals have access to all three modes (rail, road and IWW). The port has capacities for handling high and heavy and out-of-gauge cargoes, while it cannot handle full block trains in the port area. However, it can handle intermodal cargo units.

Total length of the quay is 1700 m, out of which 260 m is vertical quay and 1000 m is sloped quay. The length of undeveloped quay, available for extension, is 400 m. The port can handle max 7 vessels at the same time. No information on the anchorage capacity was available.

The port has 3 road entrances with the total of 6 traffic lanes. It has only one single track rail access. Total length of quay side railway tracks is 800 m, while the total length of the railway tracks in the port area is 3.000 m. The port has 13.000 m^2 of storage capacity for dry bulk and general cargo, and 10.000 m^3 of storage space for liquid bulk cargoes.

Bunker supply is provided by a bunker barge in the port area, while no alternative fuels supply facilities are planned in the foreseeable future. The port has the necessary facilities for ship-generated waste collection, as well as for the used oil (oily waters, bilge and sludge) collection from vessels.

Figure 28: Port of Vukovar

(Source: www.seebiz.eu)

4.8.4 Special infrastructure regarding surface pavement & drainage of rain water

There is a rain water separator in the area dedicated for trucks parking.

4.8.5 Hinterland connections (road, rail and IWW)

The port is connected to the cities of Županja, Vinkovci and Brčko (Bosnia and Herzegovina) via M55 road. The same road connects the port to the highway E-75, connecting Zagreb and Belgrade. Road M2 connects the port with the city of Osijek and thereafter with the road corridor Vc (Budapest – Osijek – Sarajevo – Ploče).

With the short distance to Osijek and Vinkovci, the port is connected to the national and international railroad systems and the Pan-European Corridor Vc.

The port is located on the Danube, which represents a Pan European corridor VII and is a part of the Rhine-Danube Core Network Corridor.

4.8.6 Hinterland (economic situation in the port's hinterland)

Vukovar-Srijem County, as the immediate hinterland of the Port of Vukovar, occupies a part of Slavonija and Srijem, geographic regions on the east of Croatia, and it is as such Croatia's easternmost county. Given that the County borders two countries, the Republic of Serbia on the east and Bosnia and Herzegovina on the south, it has an important geostrategic position for the Republic of Croatia.

The favourable geographic position of the County, which represents a significant traffic transversal route in the east-west and north-south direction and very well developed road, railway and river traffic, are a significant advantage of this area when it comes to opening towards the East-European markets.

Vukovar-Srijem County has huge potential in agriculture and forestry and its geographic location makes it an excellent stakeholder in logistics and all types of transport of people, goods and services. It is open to new opportunities and investment, and it bases its economy on high-quality and skilled workforce and sustainable use of natural and cultural heritage and very high level of social inclusion.

GENERAL INFORMATION:
Area: 2.448 km2
Administrative centre: Vukovar (26.716)
Population (2011): 180.117
Climate: Continental
Administrative units: 5 towns and 26 municipalities
GDP per capita (2008): 6,647 EUR
Unemployment rate: 21.4%
Average net salary (2011): 465 EUR

4.8.7 Major port users

Main business fields in the immediate hinterland are food and beverage industry, wood processing, metal, building materials and construction industry as well as textile and leather industry, producing for the domestic and international markets. In Vukovarsko-Srijemska County the following companies have been identified as port customers:

- DDSG-Cargo Vukovar d.o.o. (petroleum products)
- EuropaMil d.o.o. (petroleum products)
- Promil d.o.o. (gravel / sand products)
- TBG Beton (concrete products)
- Vupik (grain products)

DDSG-Cargo Vukovar d.o.o. deals with petroleum products, planning to expand its turnover gradually by importing diesel from Eastern Europe for inland distribution. Furthermore, the company EuropaMil d.o.o. - handling petroleum products as well plans to start its import and export business dockside the port of Vukovar. Located in Osijek, Promil d.o.o. is an expanding company with about 60 employees. Besides present activities in the Port of Vukovar – dredging sand from the Danube river – Promil plans to settle transactions in coal, coke, gravel and fertilizer in the port of Vukovar. The coal shall be imported from Russia Bulgaria by the company of “Terval and Eagle Energy-Liege Belgien” and mainly distributed to Global Ispat Koksna in Bosnia and Herzegovina but also to local companies like Nasice cement or Sladorana

Osijek. The other goods like gravel and sand are mainly planned to serve local demand. TBG Beton – part of the "Heidelberg Zement" group – is a successful company already producing concrete dockside. Even though gravel used for the production of concrete is not yet imported by ship, company plans to envisage a considerable quantity to be handled via port.

Vupik is a privately owned enterprise located in the port area along the river bank, transacting grain business. Although major parts of the premises have been destroyed by war, the grain silos have been repaired and work properly again with a capacity of 52. 500 tons. The company exports several types of grain. Imports are not taken into close consideration mainly because of current technical problems to unload ships along the quay. Only 5 kilometres away, there is another plant of Vupik with a capacity of approx. 70.000 tons at Brsadin, which has a direct train connection to the port of Vukovar.

4.8.8 Potential port users

According to the Port of Vukovar Port Development Concept[5], the potential port users are the following:

- Dily Nasice d.o.o. in Vincovci (architectural ceramics products)
- Sladorana d.d. in Zupanja (sugar products)

Dily Nasice d.o.o. as a part of the Nexe Group d.o.o. is producing approximately 27 million roof tiles per year. Sladorana d.d. is a leading company in sugar production. Located in Županja this company also conducts business in Osijek. Sladorana considers to import coal for their plant in Osijek and to export Ethyl-alcohol to Sweden.

In the Osječko-Baranjska County, two potential users of the port were identified:

- Našice cement Group d.o.o. in Nasice (cement products)
- Belišće 1884 d.d. in Belišće (paper pulp and products).

Našice cement, owned by the Croatian holding company Nexe Group, has subsidiaries in the three countries. Besides cement, the firm produces clay roof tiles, ceramic tiles and bricks and is active in road-building and other construction. Našice cement is the most important producer of Cement and Clinker in the region of Northern-Croatia and Croatia´s second largest Cement company.

Potential port customers from the Požeško-Slavonska County are:

[5] Port of Vukovar Port Development Concept – Vol. 2: Concept of logististics, by Ing, MHC, Duisport and ABX Logistics, 2004.

- Kutjevo d.d in Kutjevo (agricultural products),
- Kutjevacki Podrum d.d. in Kutjevo (vine),
- Kamen Ingrad d.d. in Pozega (stone and concrete products).

Other smaller companies are within the engineering, textile, wood craft industry. This region provides only a minor contribution to the Croatian economy.

In Brodsko-Posavska County, the following companies are the potential users of the Port of Vukovar:

- Djuro Djakovic d.d. (Manufacture of metal structures and parts of structures)
- Klas d.d. (Manufacture of grain mill products)
- Orioloik d.d. (Furniture and polyurethanes)

Djuro Đaković d.d. conducts two main business groups: Energy and Industry as well as Vehicles and Machines. Located in Slavonski Brod the Djuro Đaković group looks back on 83 years of tradition. Located in Oriovac, Oriolik d.d. is a modern factory in private property manufacturing upholstered furniture, flexible and rigid PU foams and accompanying manufacture of wood elements, metal mechanisms and frames.

In Sisačko-Moslovačka County, a very important company from is interested to be located dockside is Petrokemija d.d. with its headquarter in Kutina. The company supplies nearly all regions of Croatia with fertilizers, clay-based products and carbon black as well as various other products within secondary productions. For Croatian means they are also a remarkable exporter. Petrokemija d.d. exports their products to the markets of Italy, Slovenia, Germany, Spain, China, USA and others.

Other port customers from the Sisačko-Moslovačka County could be Željezara Sisak d.d. (import of steel-half-products and export of pipes).

Of the companies being located in Bosnia – Herzegovina the following two have high potential and interest in using the port of Vukovar.

- Global Ispat Koksna Industrija d.o.o. in Lukavac / Bosnia and Herzegovina (coking plant)
- TBG Kakanji in Kakanji / Bosnia and Herzegovina (producer of cement products)

Of particular interest is Global Ispat Koksna Industrija d.o.o., a large coke producer located in Lukavac. The company requires huge amounts of coal for coke production. Global Ispat

Koksna plays a vital role and should definitely be taken into considerations for the port operations.
Another interesting industry in this region is TBG Kakanji, a subsidiary of Heidelberger Zement, which requires coal for their production. The company forecasts a continuous import of coal which is convenient to be imported via Port of Vukovar.

No further updated information was received from the port of Vukovar until the moment of writing of this report.

4.8.9 Planned industrial and economic developments in the port's hinterland

Industries listed in the previous chapter largely cover all planned industrial and economic developments in the port's hinterland.

4.8.10 Cargo statistics

Overview of all cargoes transhipped in the last 10 years in the Port of Vukovar is given in Figure 29. Most frequent cargoes handled in the port were metal ores, cereals, coal, fertilizers, iron and steel products, as well as construction materials.

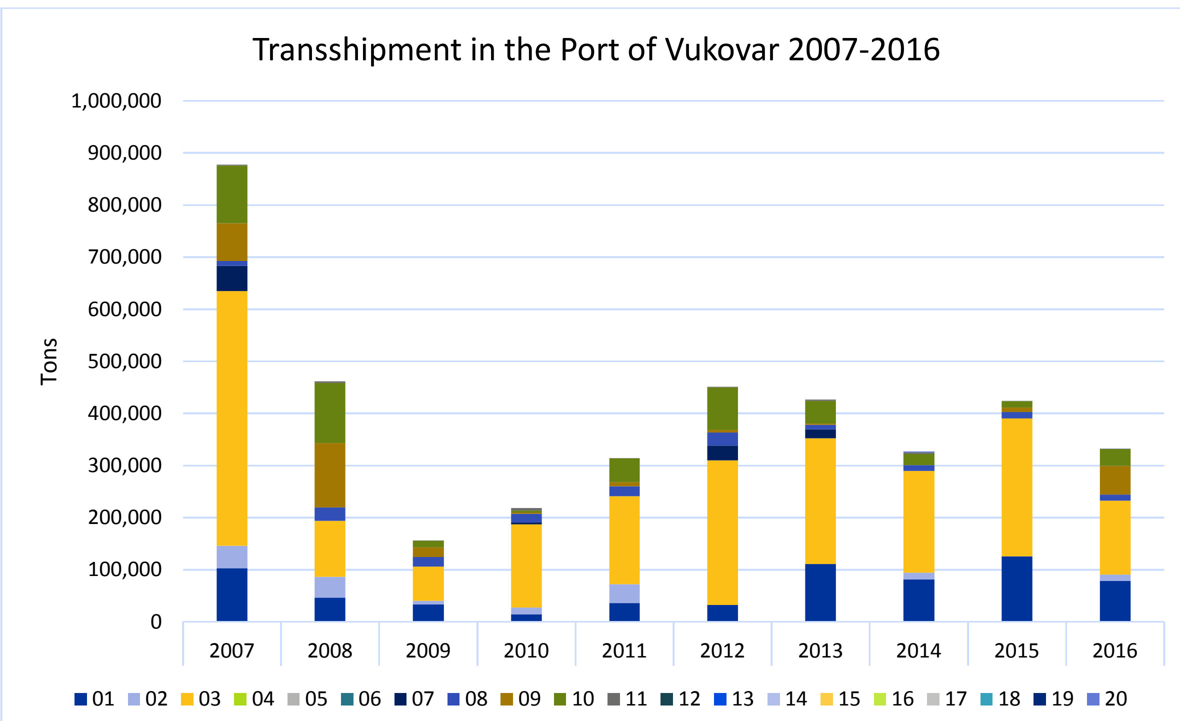

Figure 29: Transshipment in the Port of Vukovar 2007-2016

(Source: iC consulenten, based on data provided by Port Authority Vukovar - PAV)

4.9 Port of Novi Sad

4.9.1 Position

The Port of Novi Sad lies along the left bank of the Danube River at km 1254, at the entrance of the Danube-Tisza-Danube Canal (DTD Canal). Port area covers both sides of the canal between city center and industrial zone, thus enabling multiple functions of the port (city logistics, import & export of mass products etc.).

Located on the intersection of the rail/road corridor X and waterway corridor VII, the Port of Novi Sad has international importance.

4.9.2 Ownership, administration (governance) and operation

The owner of the port land and most of the infrastructure is Republic of Serbia. Only the infrastructure of the Oil Terminal is owned by the private company operating the terminal.

In 2013 Government of the Republic of Serbia established the Port Governance Agency that is in charge of management and development of all ports and harbours in the Republic of Serbia. Agency is responsible for determination of port areas, port concession agreements, licensing of port operators etc.

Currently, there are two licensed port operators in the Port of Novi Sad. “Luka Novi Sad” a.d. is a joint stock company operating the Multipurpose Terminal. Majority of shares (99%) are owned by the Republic of Serbia. “NIS” a.d. is a joint stock company operating the Oil Terminal. Port is open to the public.

Figure 30: Port of Novi Sad

(Source: www.skyscrapercity.com)

4.9.3 Infrastructure assessment

The port covers a total surface of 24,19ha. There is no free space for further development within the port area, but there is land bordering the port area where port could expand. It is canal type of port with maximum available draft maintained at 4 meters (waterway limitation is usually less). Its maximum designed cargo handling capacity is 2.000.000 tons/year. Anchorage has the capacity to accommodate 12 vessels.

The port has one multipurpose trimodal terminal and one oil terminal. Total quay length of the multipurpose terminal is 800m, out of which vertical quay is approximately 170m. Five vessels can be simultaneously accommodated and serviced.

Terminal has 6000m of railway tracks and through one single-track entrance is connected with the national railway network and nearby Pan-European railway Corridor X. Full block trains can be handled within the port area and along the quay wall. Three tracks in total length of 1188m (393m+471m+324m) are positioned along the quay.

Multipurpose Terminal has two road entrances with total of 4 lanes.
Oil Terminal has three piers equipped for loading/unloading operations with liquid cargo. Separate road entrance with two lanes for Oil terminal is available through nearby Oil refinery.

Waterside handling of multimodal units is limited with the lifting capacity of the portal crane (27t). 100.000m2 of open storage space, 44.000m2 of covered storage space and 270.000 m3 for liquid cargoes are at disposal for port users.

Bunkering is available in the port, at the Oil Terminal. Currently, no plans for supply of alternative clean fuels (such as LNG) have been reported. Waste collection or used oil facilities are not available at the port. Shore-side power supply for vessels is available at certain berths.

4.9.4 Special infrastructure regarding surface pavement & drainage of rain water

Surface pavement and drainage of rain water has been executed according to the building and construction standards of such systems at the time the port was built (1980s). There is no water pre-treatment.

4.9.5 Hinterland connections (road, rail and IWW)

The Port of Novi Sad is located in the vicinity of the rail/road Trans European transport corridor X (Budapest – Belgrade – Thessaloniki). Road connection of the port area with the corridor is less then 3km, while rail connection is only 300m long. Connection with the other part of road corridor X (Ljubljana – Zagreb – Belgrade) is available through the state road Novi Sad – Ruma. Being centrally located and the administrative centre of Vojvodina province, Novi Sad has good road connections with all cities and municipalities in province, through network of state roads.

At the same time, port is positioned on the part of the river Danube which complies with the class VIc, allowing the service of vessels with maximum length and tonnage.

Due to its geographical location, Port of Novi Sad has potential to be developed as an intermodal port centre. Thus, port was included in the Core Network of Ports on the Rhine-Danube Corridor.

4.9.6 Hinterland (economic situation in the port's hinterland)

Province of Vojvodina is characterised by arable land of good quality, overall economic and cultural development, great population density and demographic diversity. Vojvodina is a region which traditionally fosters multilingualism, multiculturalism and multi-confessionalism.

There are 45 municipalities and towns as local self-government units, organised in seven counties, with the seats in the following towns: Subotica, Zrenjanin, Kikinda, Pančevo, Sombor, Novi Sad and Sremska Mitrovica.

The main economic branches are: agriculture, processing industry, wholesale and retail, construction, energy, transport and communications, textile industry, electro-mechanical and complementary automotive industry, ICT, business services, logistics and tourism.

Agriculture is a priority sector in Vojvodina. Traditionally, it has always been a significant part of the local economy and a generator of positive results, due to the abundance of fertile agricultural land which makes up 84 % of its territory. The share of agribusiness in the total industrial production is 40%, that is 30% in the total exports of Vojvodina.

Agricultural waste represents a significant source of biomass and great potential for its utilisation in energy production.

GENERAL INFORMATION:

- Area: 21.506 km2
- Capital and Administrative centre: Novi Sad (298.139)
- Population: 1.931.809
- Climate: Continental
- Administrative units: 7 counties/towns and 45 municipalities
- GDP per capita (2014): 4,663 EUR

4.9.7 Major port users

In the cargo structure, bulk cargo dominates over general cargo, which is almost negligible. Agricultural products in bulk, as well as different fertilisers in bulk represent the majority of cargo transhipped in port.

Import of fertilisers are balancing still larger export volumes over the import of goods.
The most commonly handled cargoes are grains, fertilizer components, scrap iron, ferrous metal products etc.

Companies that are major port users, and goods transhipped in port are listed below:

- AGROGLOBE D.O.O. - grains
- ANOVA NNL D.O.O. - grains
- KONZUL D.O.O. - grains
- MK COMMERCE D.O.O. – grains
- MAT AGRO D.O.O. - grains

- NIS A.D. – oil and oil refinery products
- PROMIST D.O.O. - ferilisers
- ULJARICE-BAČKA d.o.o. - grains
- UTP FERTILISERS DOO - fertilisers
- ŽITO BAČKA D.O.O. - grains
- BOM TRADE D.O.O. - salt
- CENTAR ZA RECIKLAŽU D.O.O. – scrap iron
- DELTA AGRAR D.O.O. – grains.

4.9.8 Potential port users

Current users of the Port of Novi Sad are major companies from the area of agricultural production and depending industries (i.e. fertilisers) based all over Vojvodina province. Considering the fact that future development of the port is based on multimodal transportation, potential port users could be companies that already have or plan to start industrial production, or those companies whose products are suitable for transportation in containers. Some of these companies are from automotive industry (Delphi, Lear corporation etc.), and others are from agribusiness/food production (Sunoko, Danubius, Mirotin, Dijamant).

4.9.9 Planned industrial and economic developments in the port's hinterland

Having in mind geographical position of the port, the whole province of Vojvodina could be considered as port hinterland.

Government of Vojvodina, in cooperation with Serbian Development Agency (RAS), implements activities on attracting new foreign direct investments, providing institutional support to direct investors, realization of important infrastructure projects, further decrease of unemployment, development of local communities etc.

Improving the business infrastructure is another target to be reached in coordination with local self-governments. Beside improving of existing industrial zones, there are ongoing activities in developing new ones in Šid, Srbobran, and Titel.

The provincial Government prepares and implements the most important infrastructure projects. The first group covers national infrastructure projects that are funded from the Serbian state budget and are important for Vojvodina. These are projects like the construction of the Belgrade-Subotica railroad and preparatory work on the large-scale transport and water infrastructure corridors with the aim of enabling a faster transport, an easier access to industrial centers, and having more agricultural land covered by irrigation. All available financing resources are being used, such as European, national, provincial and local funds.

The construction of the Novi Sad-Ruma motorway, that includes a tunnel through Fruška Gora, is also one of those big infrastructure projects. In Novi Sad, several industrial zones will lie on the future Petrovaradin bypass, as well as two brand new industrial zones in Irig and Ruma. At the same time, the project will boost the development of tourist potential of Fruška Gora.

Government of Vojvodina is currently drafting the Decree on Incentives for Investors and plans to launch a public call for grants, in the amount of 350 million dinars that will be available to investors. The subsidies will be allocated according to the number of new jobs created, first in domicile and then in foreign companies, and the allocation criteria will be precisely defined and completely transparent.

In 2016, a total of 140.97 million EUR worth of investments were made in Vojvodina which resulted in creation of 3,922 new jobs. Since the beginning of 2017, a total of 47.5 million EUR worth of FDIs were made in Vojvodina. In 2017 FDIs led to creation of 2,303 new jobs. In terms of the country of origin of the 2017 FDIs, German companies dominate since they made 51,6% of the total number of FDIs in Vojvodina. Italy follows with 21,1%, and Canadian-Austrian companieswith 12,6%. Considering that most FDIs in 2017 were made in production (with the exception of the Logistics Centre in Šimanovci), which resulted in hiring over 2,000 new workers, we can expect the existing production volume to grow, new production facilities to be opened and products made in them to be exported. As a result, the volume of Vojvodina's exports will grow, and the export to import ratio will improve.

4.9.10 Cargo statistics

Overview of all cargoes transhipped in the period 2010-2016 in the Port of Novi Sad is given in the following chart. Most frequent cargoes handled are grain, cereals, fertilizers, salt, oil products and steel scrap. Agricultural products have the largest share, followed by the fertilisers and oil refinery products. Reliable data for the Oil terminal is available only for the period 2013-2016. However, increase of the cargo volume is notable for the 7 years period.

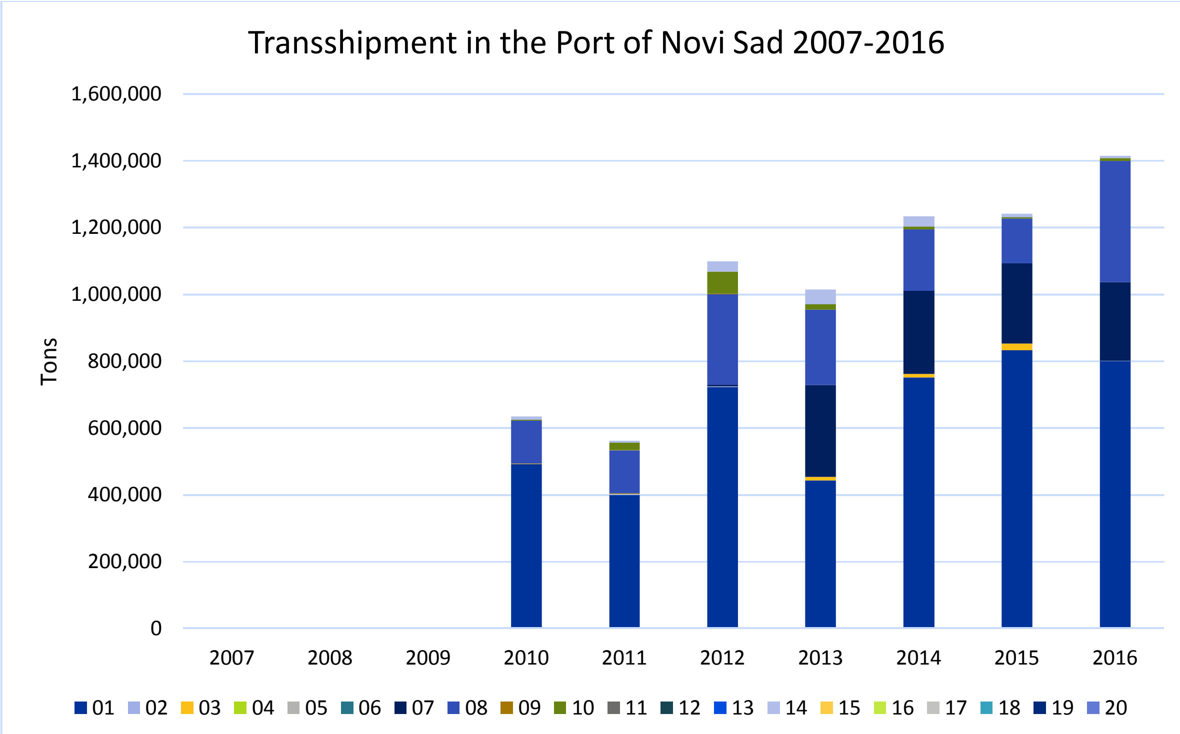

Figure 31: Transshipment in the Port of Novi Sad 2007-2016

(Source: iC consulenten, based on data provided by Port Governance - PGA)

4.10 Port of Belgrade

4.10.1 Position

The Port of Belgrade lies along the right bank of the Danube River at km 1168, in the immediate vicinity of the city centre. The port has one basin.

Located on the intersection of the rail/road corridor X and Rhine Danube corridor, the Port of Belgrade has international importance.

Passenger terminal of the Port of Belgrade is located at the right bank of the river Sava at 0+400 km.

4.10.2 Ownership, administration (governance) and operation

Republic of Serbia is the owner of the port land, while the infrastructure is owned by the private company operating the port.

In 2013 Government of the Republic of Serbia established the Port Governance Agency that is in charge of management and development of all ports and harbours in the Republic of Serbia.

Agency is responsible for determination of port areas, port concession agreements, licensing of port operators etc.

Currently, there is one licensed port operator in the Port of Belgrade. "Port of Belgrade" a.d. is a joint stock company with the majority of shares owned by the private company.
Port is open to the public.

Figure 32: Port of Belgrade

(Source: www.lukabeograd.com)

4.10.3 Infrastructure assessment

The port covers surface of approximately 90ha. Located near the city centre, the port has been surrounded by the urban area. There is no free space for further development within the port area. Authorities started planning activities for development and construction of the new port in Belgrade.

Existing port is basin type of port with maximum available draft maintained at 4 meters (waterway limitation is usually less). Its maximum designed cargo handling capacity is 3.000.000 tons/year and 12.000 TEU/year.

The port has one multipurpose trimodal terminal. Total quay length is 940m, out of which vertical quay is approximately 610m. Eight vessels can be simultaneously accommodated and serviced.

Port of Belgrade has 12500m of railway tracks and through one single-track entrance is connected with the national railway network and nearby Pan-European railway Corridor X. Full block trains can be handled within the port area and along the quay wall. Five tracks in total length of 2.400m (3 x 600m + 2 x 300m) are positioned along the quay.
Port has three road entrances with total of 6 lanes.

Anchorage has the capacity to accommodate 12 vessels.

Port has been equipped for waterside handling of multimodal units. Area of 12.000m2 is reserved for the container terminal. The port has 600.000m2 of open storage space and 220.000m2 of covered storage space available for port users.
Bunkering is not available in the port. Currently, and no plans for supply of alternative clean fuels (such as LNG) have been reported. Waste collection or used oil facilities are available at the port. Shore-side power supply for vessels is available at all berths.

4.10.4 Special infrastructure regarding surface pavement & drainage of rain water

Surface pavement and drainage of rain water has been executed according to the building and construction standards of such systems at the time the port was built (1960s & 1970s). There is no water pre-treatment.

4.10.5 Hinterland connections (road, rail and IWW)

Surrounded with the urban city area, the Port of Belgrade is experiencing problems with cargo coming in and out of port by road or railway. City has limited transit of heavy trucks through the city center. Currently port has only road link with the city ring road, which is still under construction, through the old bridge over the river Danube. As soon as the railway ring road is completed, it is expected that current railway connection of the port will be terminated. However, the city of Belgrade is positioned on the crossroads of several corridors. Rhine Danube corridor is very important for the transport system of the Republic of Serbia, as it connects Black Sea and the North Sea and major hubs in overseas trade. From Belgrade to its mouth, river Danube complies with the class VIc, which is expected to allow the service of vessels with maximum length and tonnage.

Rail & road Corridor X (Salzburg (A) - Ljubljana (SLO) – Zagreb (CRO) – Belgrade (SRB) – Niš (SRB) – Skopje (MK) – Veles (MK) – Thessalonica (GR)) with all its branches (Budapest (SRB) – Novi Sad (SRB) - Belgrade (SRB), Niš (SRB) - Dimitrovgrad (SRB) - Sofia (BG) - Istanbul (TR), enables connections with central Europe, Adriatic Sea, Ionian sea and Near East.

The city of Belgrade also has good road connections with all cities and municipalities in the Republic, through network of state roads.

Due to its geographical location, City of Belgrade has potential for development of important intermodal port centre, and the port was included in the Core Network of Ports on the Rhine-Danube Corridor.

4.10.6 Hinterland (economic situation in the port's hinterland)

As a capital, Belgrade is the biggest and the most developed city in Serbia. According to the latest available data, the Belgrade region participates with 39.6 percent in GDP of the Republic of Serbia. Belgrade represents 20% of the total population of Serbia and 30% in total employment, with GDP per capita 75% higher than the average of Serbia. The main economic branches are: industrial production, import/export trade, construction, transport and communications, business services, logistics and tourism.

Investments into industry had a rising trend over recent years. The largest share of investments within manufacturing industry was recorded in the following sectors: manufacture of food products, beverages and tobacco, manufacture of base metals and fabricated metal products, manufacture of chemicals and chemical products, manufacture of other non-metallic mineral products, manufacture of cellulose, paper, and publishing activity, manufacture of textiles and textile products.

Large infrastructure projects, started by the Government or City authorities are also rising the share of the construction industry.

Greenfield investments in different industries are located in new industrial zones alongside ring road, with easy access to the road and railway corridors.

4.10.7 Major port users

In the cargo structure, general cargo dominates over bulk cargo, most of all because of traffic limitations due to the port location which is in the immediate vicinity of the city centre.

The same reason is for domination of Import over export, considering the fact that agricultural products in bulk have large share in country's export.

The most important goods traded in the port include: salt, scrap iron, ferrous metal products, coal, paper, phosphate etc.

Companies that are major port users, and goods transhipped in port are listed below:

- METALO SRB D.O.O. – scrap iron

- BOM TRADE D.O.O. – salt
- SALINEN D.O.O. –salt
- ELIXIR ZORKA - MINERALNA ĐUBRIVA DOO – fertilizers
- CENTAR ZA RECIKLAŽU D.O.O. – scrap iron
- KOPOVI A.D. – clay
- KRISTAL SO D.O.O. – salt
- LIDER PRO D.O.O. – coal
- SPLENDID COMPANY D.O.O. – ferrous metal products
- THYSSEN KRUPP MATERIALS D.O.O. – ferrous metal products
- YUGOTUB D.O.O. – ferrous metal products
- FABRIKA HARTIJE BEOGRAD DOO - paper.

4.10.8 Potential port users

The city of Belgrade is constantly developing and position of the port practically in the city centre is a limiting factor for keeping current users and attracting new users.

However, industrial and economic development of the city of Belgrade and wider hinterland described in the next chapter, are proving the necessity for the port services, especially in terms of multimodal transportation. In line with the completion of the construction works on the Belgrade ring road, many national and international logistic companies built warehouses close to the highway or to the ring road. All these companies, as well as other wholesales and distribution centers are potential port users. Some of these companies are: Mišped, ITM, Nelt, Delta transportni sistemi, DHL, Gebruder Weiss, Kuehne+ Nagel, Cargo partner, etc.

4.10.9 Planned industrial and economic developments in the port's hinterland

Master Plan of Belgrade defined the concept of development and protection of the city as a European metropolis, the centre of administration, culture, business and commerce, based on the following:

- urban renewal and enhancement of the quality of existing urban areas;
- rational expansion of urban building land and preservation of undeveloped land of natural quality;
- construction and development planning taking into account valuable elements of nature, landscape and ecologically sensitive areas;
- sustainable use and protection of water resources;
- maintenance, refurbishment, improvement and promotion of cultural goods;
- modernization and development of transport and infrastructure capacities and utilities;

- more efficient building land use, rehabilitation and urbanization of former industrial and municipal zones
- enabling construction at locations included in the Plans (new residential areas, public and recreational facilities, commercial zones, economic zones and business parks)

Most important ongoing infrastructure projects in the city of Belgrade certainly are the completion of the Belgrade ring road as well as the construction of the "outer tangent". These projects are enabling more efficient use of zones planed for industrial, commercial, economic and business development.

The total modern logistics stock in Belgrade and in its close settlements now exceeds 800.000 sq m, out of which third party logistics (3PL) operators stock amounts to app. 250.000 sq m. Belgrade and the settlements in its vicinity hold the major share in the total Serbia stock, followed by Vojvodina region. In terms of distribution sector facilities, Industrial Park Belgrade has completed the second phase of its logistics centre, totalling 11.500 sqm. After Delta and Delhaize, German LIDL is also constructing its distribution centre of 70.000 sqm in their neighbourhood, in Stara Pazova municipality. Eyemaxx is aiming to expand its existing logistics centre by developing the facility of 30.000 sq m, in addition to the operating premises of 17.000 sq m. Similarly, the investments in the manufacturing sector are also strengthened in the previous period. In addition to already established companies, such as Geox in Vranje, Leoni in Nis, Swarovski in Subotica or the most recent American Lear's factory opened in the city of Novi Sad, Mei Ta commenced the construction of their facilities in Obrenovac, while Japanese Yazaki (car parts industry) selected the city Šabac for their new plant operations. New industrial park in Belgrade is planned to be developed on the left side of the Danube, next to the Pupin Bridge.

4.10.10 Cargo statistics

Overview of all cargoes transhipped in the period 2007-2016 in the Port of Belgrade is given in the following chart. Most frequent cargoes handled are salt, metal products, steel scrap, coal and fertilizers. Overall cargo volume is decreasing due to the urban development around the port and traffic limitations. In 2007 and 2008 metal products and construction materials had the largest share, but salt and fertilisers have steadiest volumes which are slightly increasing.

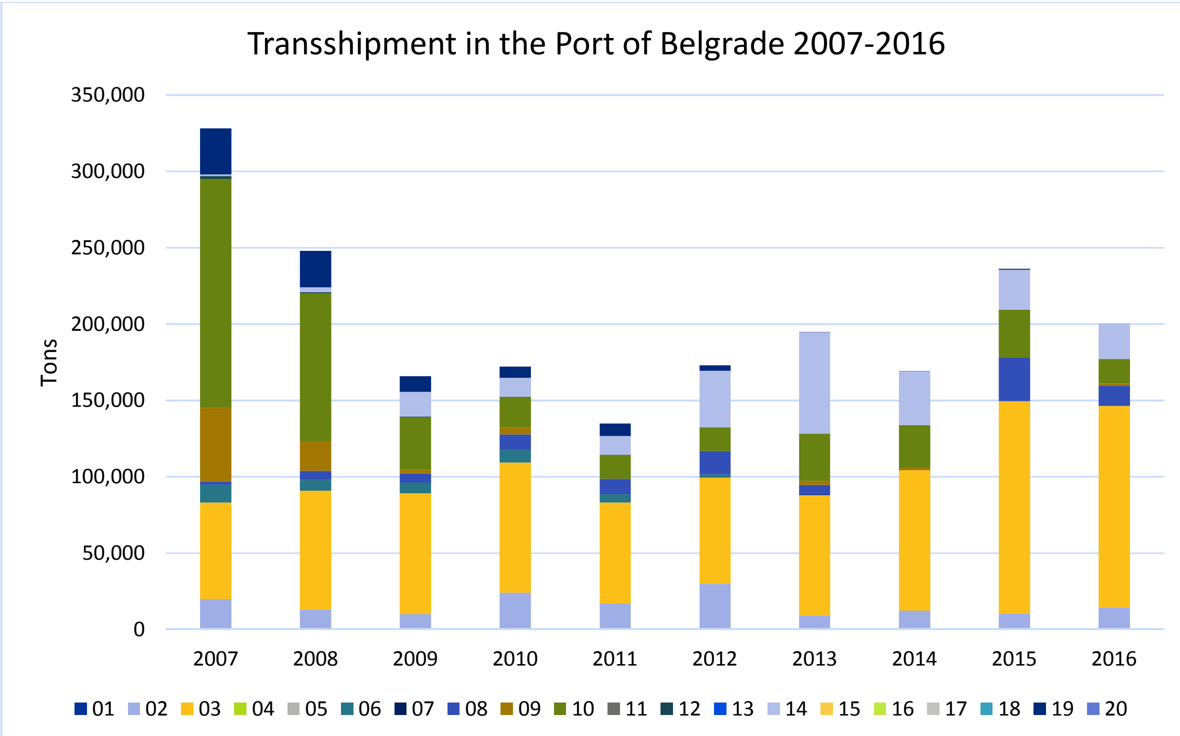

Figure 33: Transshipment in the Port of Belgrade 2007-2016

(Source: iC consulenten, based on data provided by Port Governance - PGA)

4.11 Port of Lom

4.11.1 Position

Port of Lom is a Bulgarian river port of national importance and consists of the terminals Lom and Oryahovo. The port of Lom is situated on the right bank of the Danube River on km. 742-743 in the central part of the town of Lom. It is specialized in processing general and bulk cargo, passengers, and ship supply. It has 13 berths. The port terminal Oryahovo is situated from km 678 to km 677. It is specialized in processing general and bulk cargo, and passengers. It has 3 berth places, one of them with pontoon for processing passenger vessels. The city of Lom is located in Montana province, in the north-western part of Bulgaria. Oryahovo is located in Vratsa province.

Figure 34: Location of the Port of Lom

(Source: Bulgarian Ports Infrastructure Company – BPICO)

4.11.2 Ownership, administration (governance) and operation

The infrastructure of all Bulgarian ports of national importance is public state property. The Ministry of transport, information technologies and communication exercises the rights of the Bulgarian state through the state owned company Bulgarian Ports Infrastructure Company (BPI Co). BPICo plays the role of land owner and manages the port infrastructure of the public transport ports of national importance in accordance with the Maritime Spaces, Internal Waterways and Ports of the Republic of Bulgaria Act. More specifically, BPICo is the owner of: the land, quay walls, crane lines, internal port roads, ro-ro ramps, port sewage systems, power cable networks, port railway lines, lightning network, administrative buildings, open and covered storages, electrical transformer stations, auto weighing scales and similar objects. The two terminals are operated by two private concessionaires. Operators usually own cranes, machinery, handling devices and facilities. They manage the human resources needed for handling – tallymen, dockers, etc. Administrative obligations are fulfilled by two organizations – BPI Co and Executive agency Maritime Administration. Port authority is separated from the port operator. Port operators provide port services and keep the facilities in condition fit for exploitation, and in relevance to all legislative requirements. A concession, according to the Bulgarian law is the right for exploitation of an object or service of public interest, granted by a conceder to a company – concessionaire, against the obligation to build, manage and maintain the object of the concession, or to manage the service at his own risk.

4.11.3 Infrastructure assessment

Port of Lom is the second largest river port in Bulgaria after Port of Ruse. It disposes of 38.34 ha area, 8 ha of which are free for future development. The port has one basin with 10 berths in Lom and the rest of the berths are located on the open shore. The maintained draft is 2.50 m. dredged. There are some risks and problems connected with the fluctuation of the river level due to periods with low water level, leading to limited navigation /for all Bulgarian river ports/. That reduces the transhipped cargo volumes, usually during the summer period.

The capacity for cargo handling is bigger than the existing volumes. Port of Lom, being the bigger one, can handle about 3 mln. tons/ year, and Oryahovo – 0.5 mln tons/ year. The port works 12 hours/ day, 7 days a week.

According to the regulations of Executive Agency Maritime administration, there are 5 anchorages in Lom. One of them is for dangerous cargo ships, one for flammable cargo, one for ships, arriving for handling, one for ships finished handling, and one for ships under deratization and fumigation procedures. One anchorage is located in Oryahovo. Maximum number of barges is not specified.

Terminal Lom has 2 automobile entrances and Oryahovo has one - all with two lanes. Terminal Lom has one railway entrance. Oryahovo does not have railway connection. According to port operators' data the total storage (covered and open) area is 132 thousand sq.meters. Port terminal Lom is a trimodal terminal – "road-railway-river". The length of the rail tracks within the port of Lom is 7176 m. Both Lom and Oryahovo are multipurpose port centres. There are 19 cranes in Port of Lom, with maximum lifting capacity of 20 tons. Oryahovo disposes of 3 cranes with up to 10 tons capacity. There are no data for handling heavy cargo units. Containers are not handled currently and there is no specialised terminal for this type of cargo. Estimated data for handled and stored containers in TEU are not available.

Potential possibility exists for handling full block trains within the territory of the port. Total quay length is 1745 meters with 970 meters of vertical quay. The maximum number of handled vessels is 15 for both terminals. There is shore-side water and electricity supply. No availability for clean fuels. Probably the reason for that is the low demand for clean fuels for ships by this moment.

4.11.4 Special infrastructure regarding surface pavement & drainage of rain water

Surface of the port working area is covered with asphalt, pavement and reinforced concrete slabs. One of the storage areas located on the eastern quay is not paved. There is no pre-treatment of waste waters in Port of Lom and other eco-friendly facilities do not exist. Surface water from the port area is discharged into sewage system. There are no known published future plans for development of such infrastructure in Port of Lom.

4.11.5 Hinterland connections (road, rail and IWW)

The ports of Vidin and Lom are a point of intersection of the transport corridors No. 4 (West – South) and No. 7 (the Danube). Their geographical situation determines them as points on the shortest transport way from Sofia and Plovdiv, respectively from Skopje and Thessaloniki to Central and North Europe. Port of Lom stands 162 kilometers north of Sofia, 56 km. southeast of the city of Vidin, 49 km. north of the city of Montana and 42 km. west of the town of Kozloduy. The port is connected to the national railway network and to the national road network. There are no motorways and first class roads passing through Lom Municipality. The first class road, which serves the provinces of Vidin and Montana – E-79 does not cross the city of Lom. The Republican road network is consisted of roads II-nd and III-rd class. Second class road II-81 connects Lom with Montana city and the first class road. The second class road II-81 is the most important automobile connection, linking Lom with the country. Main railway line № 7 Mezdra – Vidin from the National railway network is single, electrified (including the continuation of the line to the Danube Bridge 2 towards Romania) and with normal track gauge (1435 mm). Its length is almost 192 km. The deviations Brusartsi – Lom connects the port with the Bulgarian railway network. Second class road II – 11 (ring road Vidin - Dimovo) - Simeonovo - Botevo - Archar - Lom – ring road Kozloduy - Oryahovo - Gigen - Brest - Gulyantsi - (Debovo - Nikopol), connects the towns along the Danube.

4.11.6 Hinterland (economic situation in the port's hinterland)

The North-Western region of Bulgaria holds the last place in the country with regard to territory, population number, economic potential and GDP. Main industrial sector for the area is agriculture, followed by mining of mineral resourcses, copper concentrate and ores production, machine building, cement production, wood processing, chemical industry, etc. The only nuclear power plant "Kozloduy" in the country is located in this region. There is a port of regional importance in Kozloduy. Port terminal Lom and Oryahovo handle cargo flows from/ to Sofia, Plovdiv and Southern Bulgaria. Oryahovo is a small municipality, and the port handles mostly grain for export.

What is specific for Bulgaria as a whole is that the land transport –automobile and railway take about 90% share in the total distribution by transport modes. River and maritime transport are used for bigger lots, when the transport costs, destination and time schedule for delivery are acceptable. Automobile transport takes approximately 65 -70% share, railway transport - 20%, maritime transport – about 10% and the river transport approximately 4 – 5%.

The table below shows some basic economic indicators for Montana province, where Lom is one of the eight cities.

Table 2: Basic indicators for the non-financial sector in Montana province

Indicator	Unit	2011	2012	2013	2014	2015
Companies	Number	4 518	4 551	4 436	4 490	4 542
Employed persons	Number	23 338	23 255	23 132	23 054	23 073
Net sales revenue	Thousand BGN	1 631 192	1 729 017	1 892 672	1 962 605	2 017 490
Profitability of sales	%	6,0	6,3	4,0	6,4	6,6
Operational rentability	%	105,6	106,0	103,7	106,0	106,2

(Source: Bulgarian National Statistical Institute, www.nsi.bg)

The table for Vratsa province, where port of Oryahovo is located, states the following figures:

Table 3: Basic indicators for the non-financial sector in Vratsa province

Indicator	Unit	2011	2012	2013	2014	2015
Companies	Number	5 640	5 784	5 806	5 784	5 845
Employed persons	Number	34 467	34 831	34 062	33 450	32 812
Net sales revenue	Thousand BGN	2 318 413	2 336 591	2 308 024	2 413 950	2 463 301
Profitability of sales	%	12,0	11,5	6,0	8,7	7,5
Operational rentability	%	111,8	111,6	105,8	108,5	107,4

(Source: Bulgarian National Statistical Institute, www.nsi.bg)

4.11.7 Major port users

Port of Lom is for public transport and of national importance, accessible for all clients wishing to use its services. Main port users are forwarding and industrial companies, that import or export production and materials, etc. Users include –importers of coal for domestic and industrial use, importers of metal products and fertilizers, and companies exporting grain Ports are used as points of transhipment, storage and administrative processing of import and export cargo. Cargo inspectors, customs officers, border control officers work also with the port. Major users /except port operators, that provide port services/ in the two terminals are:

1. Forwarding companies – acting as mediators between end users, ports, ships owners, auto- and railway companies;
2. Direct exporters and importers – industrial companies that produce and export good and material or that consume materials and goods /need import/;
3. Ship owners, ship agents – taking care for organization of the river transport;
4. Control bodies – inspections, border and customs control, etc.

Depending on the port operator:

- Port terminal Lom with private operator has wide variety of clients and users dealing with export and import.

- Port of Oryahovo with private operator working in the field of agricultural production and commerce – handles predominantly grain for export and import of fertilizers.

4.11.8 Potential port users
Users and activity of the port depend on the operating companies. Port of Lom is given under concession to the biggest river vessel owner in Bulgaria. That gives possibility to attract and handle cargo by offering complex service – transport, handling, storage, etc. The port is open for transit cargo from/ to Macedonia and Greece. The railway connection gives possibility for a link with port of Thessaloniki. There is unused capacity for handling and storage of cargo in Lom. The concessionaire of Oryahovo terminal is working in the field of grain and fertilizer handling. Due to the small scale of the terminal, it has less possibilities for attracting new users.

4.11.9 Planned industrial and economic developments in the port's hinterland
There is a limited development in the North-western region of Bulgaria during the last years, and it takes one of the last positions in the EU rating of the regions. This region is strongly dependant on external intervention for resolving of the accumulated economic problems, as it does not have its own potential. There are good opportunities in the field of agriculture – plant and livestock breeding, development of new industrial companies.

Strategic plans for development of the region include improvement of the existing transport infrastructure, strengthening of the collaboration with Romania, development of the favourable geographical location on the European transport corridors. The transport infrastructure related to EU Corridor № IV is not well developed. There is potential in improvement and further growth if investment is attracted. The vicinity of the Danube Bridge in Vidin requires well connected area for servicing increased transport flows. Port terminals do not play such important role in the economy of the region now. Improvement of the Danube navigation conditions and attracting cargo (including transit and intermodal cargo) from Western Europe would generate higher incomes and create new working places.

4.11.10 Cargo statistics
Cargo statistics include data provided by port operators and data at disposal of BPICo. For some years (as 2007, 2008 and 2012) there is not enough information about cargo break down by type. That is why for these years statistics are given as type – "Other goods not elsewhere classified ". Also, there is not enough clear statistical reporting on road and rail traffic handled by river ports. Data are predominantly for waterborne transport.

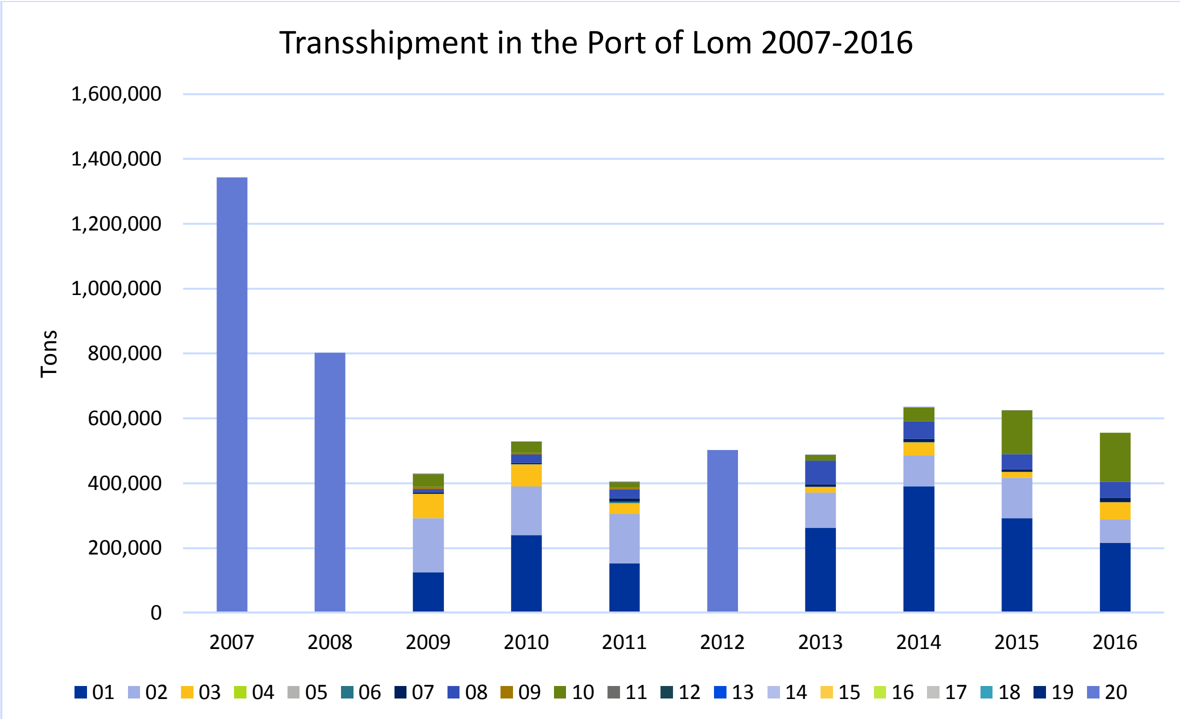

Figure 35: Transshipment in the Port of Lom 2007-2016

(Source: iC consulenten, based on data provided by BPICO)

Cargo flow has significantly decreased after the year 2008. The main reasons for that is the closing of the industrial zone "Kremikovtzi" near Sofia – one of the main customers of Port of Lom, and the other is the financial crisis that had its negative impact on all Bulgarian ports. After 2009 cargo traffic stabilized on a new lower level. The graphic above shows that there is almost 50% drop down of the handled cargo tonnage. There are macroeconomic indicators that the recovery from the economic crisis started after 2011.

Port terminal Lom has handled almost 90% of the total quantity reported for the period 2007 – 2016. The port has relatively diversified cargo structure compared to Oryahovo. Port terminal Oryahovo has a share of 10% where grain and fertilizers are the main types of handled cargo. If we eliminate the data without breakdown by type, the following cargo structure is valid: 46% is the share of group 01 Products of agriculture, hunting, and forestry. The import of coal takes 24% share, 12% is the share of group 10 metal products, group 03 ores and mining products takes 8 %, and group 08 – chemical products is also 8% from the total cargo flow of Lom.

4.12 Port of Ruse

4.12.1 Position

The port for public transport of national importance Ruse includes six cargo terminals: Somovit, Svishtov, Ruse-east, Ruse-west, Tutrakan and Ferryboat terminal Nikopol. Port of Somovit is on km 607 of the Danube river. Ferryboat terminal Nikopol is situated on km 597. Port Svishtov is situated on the most southern part of the Danube River on the right riverbank - 554th km. from the river outlet. Port terminal Ruse - West is situated from km 497 to km 496. Port terminal Ruse – east is located on km. 489 - 490 in the Eastern industrial area of the town. This port terminal is the biggest in the Bulgarian part of the river Danube. Port of Tutrakan is located on km. 433.

Figure 36: Location of the Port of Ruse and its affiliated terminals

(Source: Bulgarian Ports Infrastructure Company – BPICO)

4.12.2 Ownership, administration (governance) and operation

As explained in previous section, the ownership of the land and infrastructure is public. There are 2 state owned companies – Port complex Ruse JSCo. – operator of Ruse-east, Ruse-centre, Tutrakan and Silistra (passenger terminal), BPICo – operator of Ruse-west and 3 private companies (in Svishtov, Somovit and Nikopol) that operate the terminals. Port authorities are BPICo and Executive Agency Maritime Administration. Port authority is separated from port operators. Although there are state owned operators, their function is not different from this of the private operators. BPICo is a temporary operator for port terminals with terminated concession contracts until finalization of the new concession procedures.

4.12.3 Infrastructure assessment

Ruse disposes of 131.20 ha port area, and 32 ha of them are for future development. Ruse-east has the biggest potential for future development of new terminals, quays, basins, storage areas etc. There are 37 cargo berths, including the ro-ro ramps. On the territory of Ruse-east and Ruse-west there are two basins with total of 14 berths in them. The rest of the berths are on the open Danube. The maximum draught is 2.50 dredged. Cargo handling capacity is about 8 mln. tons per year and the ability for container handling is estimated to 50 thousand TEU/year, storage has about 15 000 TEU capacity. This capacity is conditional and depends on working hours, technology used, mode of transport, weather characteristics, etc. If demand increases, it is a matter of organization to handle and store even bigger quantities than estimated. Currently all terminals are working far below their capacity. On the Ro-Ro terminal, located in Ruse-east, there are two parking areas with capacity of 160 TIR. Now, due to low activity of the ro-ro, parking areas are used as storages for agricultural and other machinery and equipment. Terminals within this port work 12 hours/ day and 7 days/ week. There are two ro-ro ramps – one within the territory of Ruse-east and the other is in Ferryboat terminal Nikopol. Svishtov disposes of one specialised pontoon for ro-ro activities and serves the line between the Bulgarian city and Zimnicea, (Romania) across the Danube River. There is no special area for container terminals, although there is actual capacity for handling such type of cargo. Usually port terminals are multipurpose (except the terminal in Nikopol, which has only 1 ro-ro ramp) and rearrange their activity according to clients' needs. From all 6 terminals described, Tutrakan and Nikopol do not have railway access. Ruse-east has the biggest capacity with regard to heavy-lift cargo – 60 tons is the maximum weight of a unit lifted with two cranes simultaneously. The floating crane working in Ruse area, owned by the Agency for exploration and maintenance of the Danube River, has lifting capacity of 100 tons. Oil and gas terminals exist in ports with regional importance, and are not in the scope of this analysis.

The following table represents main infrastructure data for each terminal, proving that Ruse-east is the leading port within the scope of cargo ports of national importance.

Table 4: Main indicators of Port of Ruse affiliated terminals

№	INDICATOR	SVISHTOV	SOMOVIT	RUSE-EAST	RUSE-WEST	TUTRAKAN	FT NIKOPOL
1	Total area, ha	31.8 (8.2 ha on concession)	3	82,5	11,7	0,44	1,76

№	INDICATOR	SVISHTOV	SOMOVIT	RUSE-EAST	RUSE-WEST	TUTRAKAN	FT NIKOPOL
2	Cargo handling capacity thousand tons/year	2 000	600	3 000	2 500	30	
3	Number of berths	8 (1 of which specialized for ro-ro)	2	14 (2 of which on the ro-ro)	11	1	1 ro-ro ramp
	Number of anchorages	3	4	9		2	1
4	Quay lenght	902	350	1618	1500	110	130
5	Number of cranes	11	4	14	9	1	n/a
6	Storage capacity	28 900	11 875	206 300	36 500	2 500	n/a
7	Open storages	22 800	9 700	190 500	27 600	2 500	0
8	Covered warehouses	6 100	2 175	15 800	8900	0	0

(Source: BPICO)

Port Ruse has 19 anchorages divided by terminals as follows: 4 in Somovit, 1 in Nikopol, 3 in Svishtov, 9 for the aquatory in Ruse and 2 in Tutrakan. Number of vessels per anchorage is not defined. Ruse-east, Ruse-west and Svishtov can handle block trains in the port area. According to published information, only Ruse-east actually handles block trains with containers and trailers. This terminal has the necessary machinery and equipment for transhipment of intermodal units. Total quay length of Port of Ruse is above 4600 meters. Sloped quays prevail with 3417 meters of length. There is 500 m undeveloped quay in Ruse.

Road entrances are 8, where Ruse-east and Ruse-west have two entrances each. Ruse-east, Ruse-west and Svishtov have rail entrances also. Somovit has railway connection that is not in exploitation. Total length of rails tracks in the terminals is 8759 m. Storage capacity amounts to 286 thousand sq.m., 88% of which are open storages. There is no availability of clean fuels in the port of national importance. The only terminal for LNG is located in Ruse and is private. It is not an object of this analysis. There are no waste reception facilities, but plans for building such infrastructure exist. Ships have access to shore-side power and water supply.

4.12.4 Special infrastructure regarding surface pavement & drainage of rain water

There is a sewage system for surface water discharge. There is no preliminary water treatment in the port. Surface is covered with concrete slabs and asphalt. One of the storages is covered with crushed stone. No specific future plans exist for building new eco-friendly infrastructure. Waste oils are collected by a specialised vessel, property of the Agency for maintenance and exploration of the Danube River.

4.12.5 Hinterland connections (road, rail and IWW)

The Location of Ruse Municipality defines it as important national transport and commercial node with border crossing points on the Danube River. *Ruse has both railway and river core transport nodes as per the classification of TEN-T!*

The distance by road from Ruse to Sofia is 331 km, to Varna – 203 km, to Plovdiv – 293 km, to Pleven – 153 km, to Veliko Tarnovo – 107 km, to Silistra – 124 km.
The bridge on the Danube River between Bulgaria and Romania connects the Romanian capital Bucharest standing on 72 km distance. There is railway connection to Bucharest, Kiev, Moscow, Budapest, Bratislava, Prague, Berlin, Warsaw, Sofia, Varna and Bourgas.
The flow of vehicles through the bridge is constantly increasing.

Two European roads – E70 and E85 cross Ruse. There are no motorways passing through the city. Two I-st class roads link Ruse with the country – I2/ E-70/ from the border with Romania to Varna and I5 /E-85/ from Ruse towards the border with Greece on Makaza. Three II-class roads pass through the city. Two main railway lines start from Ruse – Line № 4 in south direction to Podkova and Line № 9 Ruse - Varna. The railway on the Danube Bridge connects Ruse directly with Romania.

Port of Ruse is the biggest Bulgarian river port on the Danube. It has a key position along the Pan-European Transport Corridors:

- Corridor VII – Rhine-Main-Danube
- Corridor IX - Helsinki - St. Petersburg - Moscow - Kiev - Bucharest – Ruse - Dimitrovgrad – Alexandroupolis
- The route of the silk – combined transport of transit cargoes via the link Varna - Ruse
- Corridor *TRACECA* – passes through the territories of 12 countries and connects Asia and the Caucasus countries (Uzbekistan – Azerbajan – Georgia) with Western Europe.

Port of Ruse is a multimodal transport centre and provides suitable connection between three modes of transport – water, rail and road transport. The port is directly connected to the national rail and road network of Bulgaria.

Svishtov is one of the biggest Bulgarian cities on the Danube River. It is at about 230 km distance from Sofia, 70 km from Ruse and 270 km from Plovdiv. The city is connected with the country by one I-class road Pleven – Byala, two II-class roads – Novgrad – Vardim – Svishtov – Oresh and Karamanovo – Vardim. There are four III-class roads passing through the city.
Port terminal Svishtov is the most southern Danube port and is located in the middle of the Bulgarian stretch of the river. That makes it convenient point for transshipment from/ to all

cities of Bulgaria. Near Svishtov are located the most problematic areas during the low-water periods – island Belene being the main threshold hampering navigation conditions.

Somovit is a Bulgarian village located on the Danube River. Linked by the II-class road II11 it is located 12 km westerly from Nikopol, 115 km from Gulyantsi, 44 km from Pleven and 196 km from Sofia. The village is connected with the railway network via the line Pleven – Yasen – Cherkovitsa. The port has two railway tracks that are not in exploitation.

Nikopol is a city on the Danube River connected with II-class roads 34 and 52. After putting the ferryboat terminal in exploitation, the road to Pleven was renewed. Tutrakan is a small city on the Danube, 61 km away from Silistra and from Ruse. Part of Silistra province, Two II-class roads (Ruse-Silistra and Tutrakan - Kubrat) link Tutrakan with the country. There is no railway connection in Tutrakan. The nearest railway stations are in Ruse and Silistra.

4.12.6 Hinterland (economic situation in the port's hinterland)

The hinterland of Port of Ruse covers wide area including the provinces of Ruse, Pleven Veliko Tarnovo, Razgrad and Silistra. Nevertheless, cargo is transported from/to all over the country. Port of Ruse serves cargo flows for Romania also. Ruse province is the biggest and well developed area within the hinterland of the port.

Table 5: Basic indicators for the non-financial sector in Ruse province

Indicator	Unit	2011	2012	2013	2014	2015
Companies	Number	10 830	10 883	10 911	11 082	11 313
Employed persons	Number	64 724	63 763	63 965	64 034	64 074
Net sales revenue	Thousand BGN	5 234 894	5 692 588	6 136 825	6 400 892	6 908 677
Profitability of sales	%	3,6	4,3	5,7	6,1	7,3
Operational rentability	%	103,3	104,1	105,6	105,9	107,2

(Source: National Statistical Institute, www.nsi.bg)

Table 6: Accumulated basic indicators for the non-financial sector in provinces Pleven Veliko Tarnovo, Ruse, Razgrad and Silistra

Indicator	Unit	2011	2012	2013	2014	2015
Companies	Number	37 941	38 197	38 218	38 621	39 362
Employed persons	Number	215 112	211 878	212 168	211 659	213 701
Net sales revenue	Thousand BGN	15 596 905	16 683 954	17 792 021	17 703 050	19 312 700
Profitability of sales	%	6,482	5,84	6,68	6,714	6,95
Operational rentability	%	106,19	105,68	106,50	106,51	106,79

(Source: National Statistical Institute, www.nsi.bg)

Well-developed economic sectors in the hinterland are: food industry (agricultural production and milling industry, wine and beverages production, sugar production, canned food production, etc.), machine building and metal processing, chemical industry, textile and apparel industry, production of building materials, glass and faience production, wood processing etc. In Ruse there is well developed Eastern industrial zone with the biggest Free Zone in the country, companies producing automobile parts, ceramics and tiles, cotton products, etc.

4.12.7 Major port users

Major users /except port operators, that provide port services/ in all ports are:

- Forwarding companies – acting as mediators between end users, ports, ships owners, auto- and railway companies;
- Direct exporters and importers – industrial companies that produce and export good and material or that consume materials and goods /need import/;
- Ship owners, ship agents – taking care for organization of the river transport;
- Control bodies – inspections, border and customs control, etc.

Depending on the port operator:

- Ruse-east with state owned operator – great variety of clients and cargo types;
- Ruse-west with state owned operator – also big number of clients;
- Svishtov with private operator – the operator handles its own cargo /inert materials/, which takes big share in the total quantities, there are also other clients;
- Somovit with private operator – handles predominantly own cargo – grain and fertilizers;
- FT Nikopol with private operator– serves the ro-ro line from/ to Turnu Magurele /Romania/. Recently the operator started handling grain with mobile equipment in this terminal;
- Tutrakan – port of local importance with zero cargo volumes for the last years.

Some major forwarding companies have offices in the port areas and serve different cargo flows. They organize the documental processing, automobile, railway and river transport, handling and storage of clients' cargo. Other companies prefer to organize this process by themselves – direct port users, either end users, or dispatchers. There are no industrial and producing companies within the territories of Bulgarian ports of national importance. Ship owners and ship agents organize ship visits, bunkering and other port activities. Port operators handle cargo by the force of commercial contracts, usually on a yearly basis. Having in mind that Ruse is located on a strategic geographical position and has wide range of handling facilities, it attracts clients and cargo volumes that could not be served in the rest of the ports. With regard to the type of cargo Ruse has the most diversified cargo structure. Users decide to use the port after calculating the price, given the planned quantities for import/ export, having in mind the final destination of the cargo, the high quality of the port service and good road, river and railway connections. According to marketing researches Port of Ruse works with traditional client base for the last 20 years. Biggest cargo volumes are generated by long-term clients, varying in dependence of the current economic situation. During the last years, new clients appeared, that organize intermodal transport of containers and trailers from road to railway mode. Unfortunately, this initiative worked successfully the last 2 – 3 years, and after that this activity decreased.

4.12.8 Potential port users

Potential port users could be importers or companies for transit cargo. Port of Ruse is working below capacity and could handle additional cargo flows for direct or indirect transhipment. Such cargo types could be vehicles and/ or new automobiles, ro-ro cargo, containers, trailers, dangerous cargo. Lot of possibilities have been discussed for attracting potential users. In order to successfully implement a strategy for growth of the port terminals, there are internal and external problems that have to be solved. Internal is accepted as the possibility to invest in new machinery, technique, infrastructure in the ports. The external problems include but are not limited to improvement of the navigation conditions of the River Danube, improvement of the incoming and outgoing transport links – roads and railways, macroeconomic development of the country. The Bulgarian economy produces relatively low cargo flows for transport outside the country. That makes harder to provide subsequent loading for transport means that import goods. This makes BG transport less competitive compared to its Western European analogue.

4.12.9 Planned industrial and economic developments in the port's hinterland

Strategic plans for the region are focused on acute social problems on a national scale – demographic crisis, aging of the population, emigration of young educated and initiative people, insufficient qualification and weak employment of the population in working age.

Plans for future development are based on strategic documents as Strategy Europe 2020, Strategy for development of the Danube Region, "Donauregionen+"project, Project Ergo mater plan Ruse-Giurgiu, National Development Programme Bulgaria 2020, National strategy for Regional development 2012-2022, etc.

Some possible positive economic developments are connected with further growth of the Industrial zones, servicing cargo flows for the Romanian capital Bucharest and other Romanian cities, building new open and covered storage areas and establishing new offices of big logistic companies.

Some plans are discussed during the years for exploiting the potential and investment in improvement of the railway link between Ruse and Varna. That would generate additional transit cargo flows.

Potential is seen in intermodal terminals also – there is a project for building of such terminal in Ruse managed by the National Railway Infrastructure Company. Unfortunately, it is stopped in the moment.

4.12.10 Cargo statistics

Port of Ruse handled 18.5 mln. tones for the reported 10-years period. Cargo is predominantly transported by ships.

Cargo group 02 prevails with 26% from the total volume, groups 03 and 01 have respectively 21% and 20% share. These three groups form 67% of the transhipped goods and define the specific economic characteristics of the region and its needs for import and export. The rest of the groups do not have significant importance in the cargo structure.

Port terminal Ruse-east handled the highest cargo volumes for the last 10 years /almost 8 mln. tons or 42%/. Terminal Svishtov is on the second place with 40%, but the prevailing cargo type is inert materials. Somovit is on the third position with 9% and stable activity. Ruse-west holds 6% of the total volume, and Tutrakan and FT Nikopol do not have significant volumes.

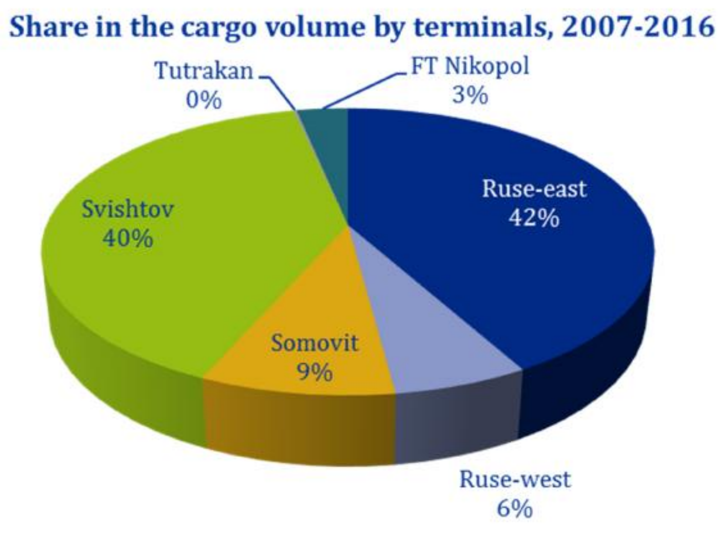

Figure 37: Share in cargo volume at the terminals of the Port of Ruse

(Source: BPICO)

Terminals in the scope of Port of Ruse have the following characteristics:

- Ruse-east: main cargo types coal, grain, wooden material, chemicals, machinery and equipment, metal products, etc. From 2014 there is regular transhipment of intermodal units – containers and trailers – from railway transport. In 2017 this activity decreased.

- Ruse-west: up till 2007 – 2008 the prevailing cargo type was metal products. After the period of crisis and the imposed quotas by the Ukraine for import of metal products, this terminal had a significant decrease in cargo volumes. In 2013 it was given under concession, but in 2015 the concession contract was terminated. Since 2015 Ruse-west is managed by BPICo and a new procedure for concession will be organized. Currently the terminal handles chemicals, grain, metal products, etc.
- Svishtov – concessioned in 2007, this terminal handles mostly inert materials, coal, metal products, grain, etc.
- Somovit – concessioned in 2009 – basic cargo types – grain and fertilizers;
- Tutrakan – for several years there are no clients that handle cargo there. Only passenger ships visit the port.
- FT Nikopol – in operation since 2010. Serves the ro-ro line Nikopol – Turnu Magurele. The private concessionaire handles also grain for export with the help ot mobile equipment.

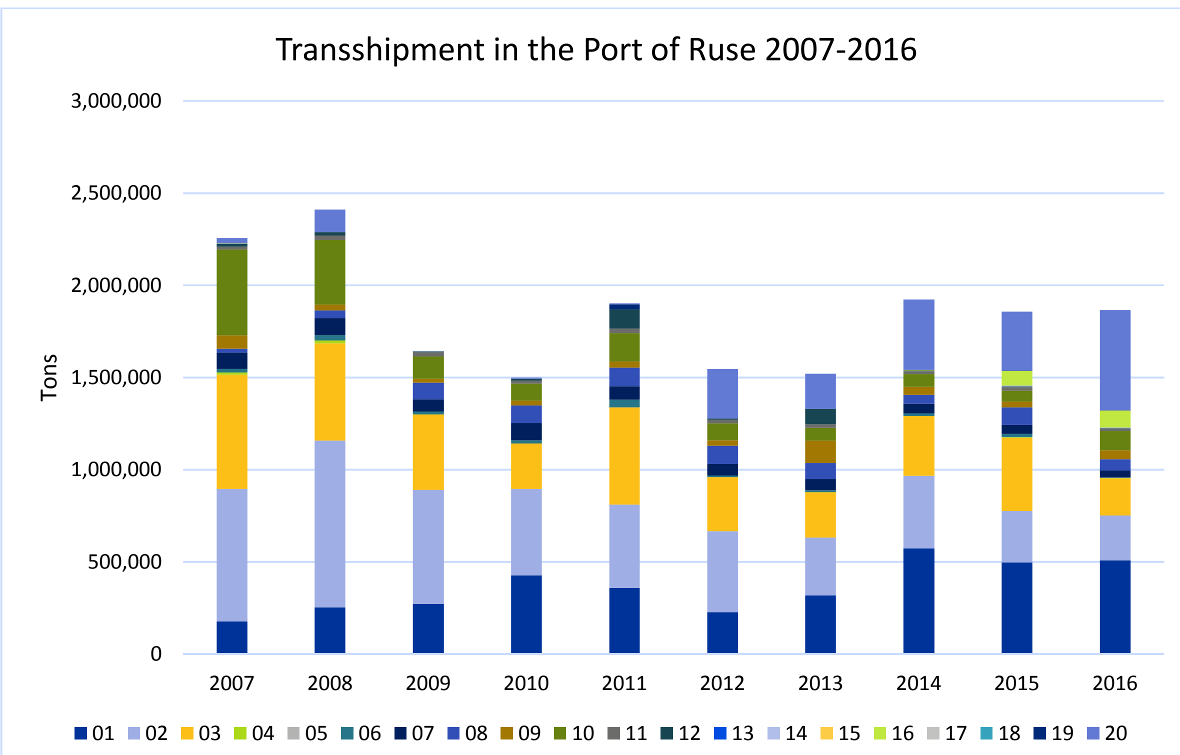

Figure 38: Transshipment in the Port of Ruse 2007-2016

(Source: iC consulenten, based on data provided by BPICO)

4.13 Port of Vidin

4.13.1 Position

The city of Vidin is located in the north-western region of Bulgaria. The port terminals of national importance included in Port of Vidin are: Vidin south (located in the south industrial zone of Vidin on km 785 of the River), Vidin north (in the north industrial zone, km 793) and Ferryboat complex Vidin (on km 792). Vidin-north and the Ferryboat complex are often accepted as one port terminal, having in mind that the concessionaire is one single company that has plans for future development with regard to the area of both points.

Figure 39: Location of the Port of Vidin

(Source: BPICO)

4.13.2 Ownership, administration (governance) and operation

Land and infrastructure are owned by the state. Administrative obligations of the Ministry of transport are maintained by two state bodies - BPICo and Executive Agency Maritime administration. Port operators are 2 private concessionaires. One of them (concessionaire of Vidin south) handles predominantly coal for industrial purposes.

4.13.3 Infrastructure assessment

Port of Vidin is the smallest port of national importance with 16.65 ha area. There are no basins. Cargo handling capacity is about 1 mln. tons per year. Port service time is 12 hours/ 7 days/ week. There is no ability for container handling, and there is lack of statistical data for container flow. Quay length is 500 meters, 440 of which is sloped. The dredged depth is 2.50 m. There is a railway connection only in Vidin-north terminal, and this is the trimodal point for the area. Vidin north and Vidin south are multipurpose terminals, although the South terminal handles almost only coal. The Ferryboat complex Vidin had significant negative change in its activity after the opening of Danube Bridge 2. All the traffic of vehicles was re-directed through the new facility. Current technical abilities of the operators do not allow handling of heavy cargo units. Vidin-north has an industrial railway line which is 1232 m. long, divided inside the work area of the port on two independent deviations, each 190 m long.

The potential of all terminals in Vidin is handling 7 vessels simultaneously. Storage capacity is 31 thousand sq. m. There is shore-side water and electricity supply. There are 5 anchorages.

4.13.4 Special infrastructure regarding surface pavement & drainage of rain water

Rain water is discharged from the concrete storage areas in the Danube river. There are no facilities for water treatment.

4.13.5 Hinterland connections (road, rail and IWW)

Vidin is situated on the crossroad of the European transport corridors № IV and №VII and is at close distance from Greece, Macedonia and Serbia. The Municipality of Vidin is characterized with favourable geographical position – its territory is crossed by the railway line Sofia – Vidin and by the first-class republican road in the north-south direction I-1 /part of the European route E79/, which links Vidin with the border crossing point Kulata - Promahon. The Municipality is linked with the second-class republican road II-11, connecting the city with the municipalities of Montana, Vratsa and Pleven. The road connection of Vidin-south is through a deviation of the entry road to the city. It has no railway connection. Vidin north is connected with the Republican railway network through connection with the relatively new railway line to the Danube Bridge 2.

4.13.6 Hinterland (economic situation in the port's hinterland)

Compared to other parts of Bulgaria, Vidin is one of the least economically developed regions in Bulgaria. More than 90% of the companies are the so called "micro companies" with up to 9 people personnel.

Table 7: Basic indicators for the non-financial sector in Vidin province

Indicator	Unit	2011	2012	2013	2014	2015
Companies	Number	3183	3121	3107	3 064	3 059
Employed persons	Number	13201	12954	12808	12 727	12 831
Net sales revenue	Thousand BGN	691444	664465	691506	682 412	705 868
Profitability of sales	%	5,7	7,5	6,5	4,1	7,7
Operational rentability	%	105,4	106,7	106,3	103,8	107,3

(Source: National statistical Institute, www.nsi.bg)

Business in the field of services prevail over production companies (which is specific for other provinces also). Some of the important companies in the region work in the sphere of: gypsum, gypsum fiber boards, wine, dairy, apparel and other goods production.

4.13.7 Major port users

Terminal Vidin-south is used mostly for import of coal. Its concessionaire is the heating plant TEC-Sviloza with head office in Svishtov.

From 2010 Terminal Vidin-north has private concessionaire who made investment in new infrastructure, machinery and technique. Port users import and export various types of cargo, but still main groups are coal, grain, metal products, fertilizers, etc.

4.13.8 Potential port users

Vidin is the first Bulgarian river port for cargo from Western Europe. That is a good prerequisite for further development of the port and the city of Vidin. Potential port users most probably would be cargo transport companies that organize transport to and from Romania (through the new Bridge), to Sofia and the rest of the country, to Greece and Turkey.

4.13.9 Planned industrial and economic developments in the port's hinterland

Economic development in Vidin province is also connected with overcoming long-term problems as bad road and railway infrastructure, slow rates of industrial development, compared to other parts of Bulgaria, aging of population, emigration, etc.

4.13.10 Cargo statistics

During the last three years there is a significant decline in the port of Vidin activity. Only Vidin-north works, but with very reduced volumes, most probably because cargo is passing through the Danube Bridge 2. Main cargo groups are grain for export, fertilizers, coal and other.

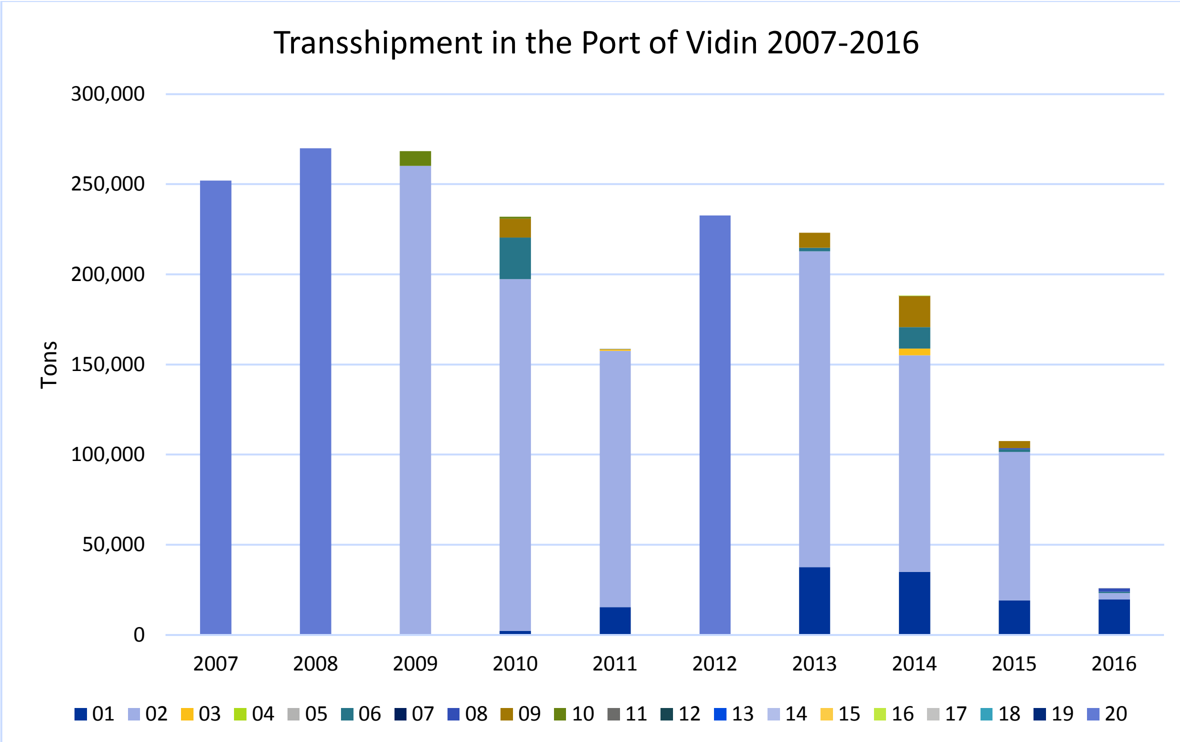

Figure 40: Transshipment in the Port of Vidin 2007 – 2016

(Source: iC consulenten, based on data provided by BPICO)

4.14 Port of Drobeta Turnu Severin

4.14.1 Position

Port of Drobeta Turnu Severin is located on the Danube left side km 927-934 (near the water storage Hydroelectric and Navigation Complex Portile de Fier 2).

The Drobeta Turnu Severin Port has a strategic location as a transhipment point on the Danube for traffic to west and northwest Romania and cities like Craiova, Târgu Jiu, Reșița.

Figure 41: Port of Drobeta Turnu-Severin on the Danube

(Source: www.portofconstantza.com)

4.14.2 Ownership, administration (governance) and operation

Port infrastructure is public property being granted to N.C. Administration of Danube River Ports J.S.Co. Giurgiu, through concession contract signed in 2008. Ministry of Transport is the owner of 80% shares of the Company, the balance of 20% being owned by Fondul Proprietatea.

The Port land owner is the state. The port infrastructure owner is N.C. Administration of Danube River Ports J.S.Co. Giurgiu, with the exception of the area where Cargill is operating the silo. Here the infrastructure is owned by the operator.

The port authority is N.C. Administration of Danube River Ports J.S.Co. Giurgiu.

4.14.3 Infrastructure assessment

Total surface of the port including 3 areas has in total 13,76 hectares (commercial 7,26 hectares, passengers 4,40 hectares and project cargo ramp 2,10 hectares). Annual cargo throughput capacity of the commercial basin is 725.000 tons/year.
The port is operating break bulk cargo, ore, fertilizers, cereals, coal, oil products, etc. There are 3 operators Transeuropa, Carghill (cereals) and Beo Trade Com (oil products).

Port allows mooring of barges up to 3000 tons and with a draught of 2,5 m.

The length of vertical quays used for cargo operation is 365 m (65 m in the cereals operation area). The cereals operator has a 35 m sloped quays in addition. Another of 400 m of sloped quays is used for waiting area and 365 m of sloped quays for winter mooring.

There are available 3 cranes (2 with 16 tons capacity and 1 of 15 tons).

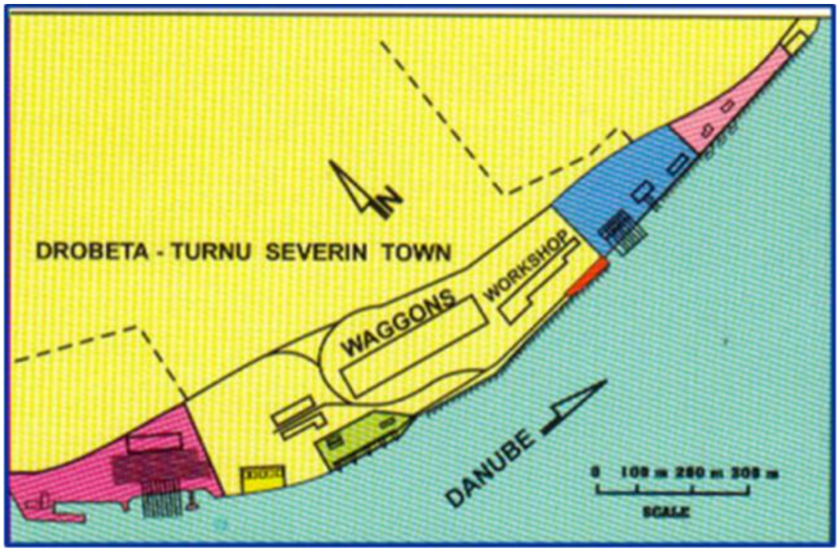

Figure 42: Port of Drobeta Turnu-Severin

(Source: www.apdf.ro)

4.14.4 Special infrastructure regarding surface pavement & drainage of rain water

During 2012-2015 the project System for taking over and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu (financed under POS-T program) was implemented[6].

The project increased the quality of services for the collection and processing of ship waste and pollution intervention by acquiring ships, installations and equipment, as well as for carrying out the infrastructure works necessary for taking / processing the residues from the river ships.

The Port of Drobeta Turnu-Severin received a multipurpose collector vessel, a compact water treatment system consisting of bilge and household wastewater treatment plant, a container for solid wastes, access towers and pontoon (including quay accessories) to be used for ships' boarding in the port.

4.14.5 Hinterland connections (road, rail and IWW)

The port is connected through two roads with singe line per way each to the city. Drobeta Turnu-Severin is connected to the national roads DN6, DN56, DN 56 A, DN 67 and the European road E70.

[6] www.apdf.ro

There are rail connections to the towns station and connected to railway corridor 900 Bucuresti-Caransebes-Timisoara, the latter being a catchment area of the Drobeta Turnu-Severin hinterland.

Drobeta Turnu-Severin is located on the Corridor Orient-East Med, as was defined by EU guidelines for the development of the trans-European transport network[7].

Figure 43: Drobeta Turnu-Severin on Corridor Orient-East Med

(Source: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html)

There is no express road or motorway in the region; DN 65 Craiova-Slatina-Pitesti does not meet the European requirements regarding passenger and freight transport. The lack of efficient inter-modal connections and facilities between the railways and the inland waterway network is the main obstacle to the export of low value-added products in the region, such as metals, wood, agricultural raw materials, mining products, etc.

The density of the railways in the S-W Oltenia development region is the smallest in the country – 33,9 km / 1000 km^2, and the plain area along the Danube does not benefit at all from the railway network[8].

Also, there are no rail border crossing points at Drobeta Turnu Severin to Serbia, the freight flows between the region and the neighbouring countries being made more difficult.

[7] Regulation no. 1315/2013 of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU.
[8] South-West Oltenia Region Development Plan 2014-2020, www.adroltenia.ro (in Romanian language)

4.14.6 Hinterland (economic situation in the port's hinterland)

The Port of Drobeta Turnu-Severin in located close to the border of West and South –West development regions, its development strategies taking into consideration these regions as main hinterland.

The economic development in West Region proved to be for a long period of time very good, attracting the highest level of foreign investments (reaching 5,200 mil Euro in 2015, 8.1% from the total), after the Bucharest (60%).

Unfortunately, the South-West Region, where in fact is the port located, is one with a low level of development, being one of the three Romanian regions with GDP level less than 50% of EU average. In the latest period Mehedinti County registered one of the lowest GDP levels in the country, only two other counties having lower results.

There are developed urban centres in the area like Craiova, Târgul Jiu or Reșița. An important economic actor in Dolj County is Ford Romania, which attracted a number of investments from the automotive industry providers (Johcon Controls, Kautex, Magna, Faurecia, Coper Standard). But in the same county is located another Danube port: Calafat.

The most important producers in close area are: Euro Tire (tire factory) and Landro (pulp and paper). The cement factory from Târgu Jiu is generating some cargo traffic in the port.

4.14.7 Major port users

The port users are represented mainly by ships' operators, terminal operators, shipyard and other companies involved into delivery of inland water transport related services, such as ship's agents, survey companies, etc.

There is a number of ships' operators from the riparian countries, a large part of them having ships registered in Romania, such as CNFR Navrom SA, Metaltrade International, Beo Trade Com, etc.

There are three terminal operators for oil products, general cargo and cereals, but due to the economic situation in the hinterland they do not register a high level of cargo traffic.

TTS –Transporturi Fluviale (*www.ttsfluvial.ro/severin.html*)

Short description:

- Vertical quay with a length of 300 m with the possibility of operating the goods in domestic and international trade at three different berths;
- The water depth at the quay is 4-5 m, without level fluctuations;
- 2 cranes 16 t and one 5 t portal crane;

- 2 bunkers for bulk cargo;
- Weighting machine for rail wagons (100 tons) and , electronic weighting machine for trucks (80 tons);
- loading / unloading lines for grain handling directly from specialized wagons;
- Bulk chemical fertilizer handling equipment;
- Bagging equipment for 500/600 kg bags;
- Grain storage warehouse with a surface of 1,000 m^2 (about 3,500 to);
- General cargo storage with an area of 785 m^2;
- Pavilion storehouse with an area of 1,080 m^2;
- Multifunctional hall with a surface of 394 m^2;
- Concrete platform for storage of general cargo with an area of 12,250 m2;
- 4 locomotives.

Inside the port there are: customs point and ship agency. The port has video surveillance system and equipment to prevent and extinguish fires.

Beo Trade Com (www.loratel.ro)

Turnu Severin oil terminal has a transbording capacity of 2,000 tons/day. There are transferred oil products between rail and tankers / barges.

Cargill (www.cargill.ro)

The Drobeta silo - which was put out of operation in 1999 - became an integral part of Cargill's business and determines the expansion of the supply and coverage network at both national and international levels.
The storage capacity of 44,000 tons increased the operational capacity of the Cargill silos by 8 percent.

A small number of other companies are involved in providing services for ships and cargo, such as ships' repairs, supply, agents and survey.

4.14.8 Potential port users

The potential users to be taken into consideration by the port for future developments are the small number of producers in the area, as well as the agriculture actors.

Anyhow, the potential port development is very much challenged by the road access to the port area, which needs urgent improvement works.

4.14.9 Planned industrial and economic developments in the port's hinterland

The general strategies developed by local authorities includes among the strengths the position of the city on a European main transport corridor, as well as the connection on rail and road with the region and as an opportunity is recorded the regional European policies regarding the Danube and Black Sea.

Unfortunately, no relevant industrial or economic developments are planned to be able to bring a significant increase in port traffic.

The energy sector will remain important in the local economy and some steps are done in the development of tourism.

4.14.10 Cargo statistics

The Port of Drobeta Turnu-Severin operated in the last years mainly oil products, cereals, fertilizers and metal products.

According to data provided by N.C. Administration of Danube River Ports J.S.Co. Giurgiu, the average annual throughput is about 350.000 tons with good results in 2007, 2010, 2011 and lower values, less than 300.000, in 2009, 2014, 2016.

The lack of investments in port infrastructure and hinterland connection, together with low economic development led to a decrease of cargo traffic in the last two years.

The oil products traffic registered in 2016 a value of 186.755 tons, but there have been years with better results, such as 2009 (238.447 tons) and 2010 (326.312 tons).

Cereals collected from the producers in the area are exported through inland water transport, registering an annual traffic of about 25.000 tons, but decreasing in the last two years at 14,000-15,000 tons.

Other two cargo categories with some results in the last period are fertilizers (13.862 tons in 2016) and metal products (33.027 tons in 2016).

Please see Annex II for detailed data related to cargo type and operated volumes.

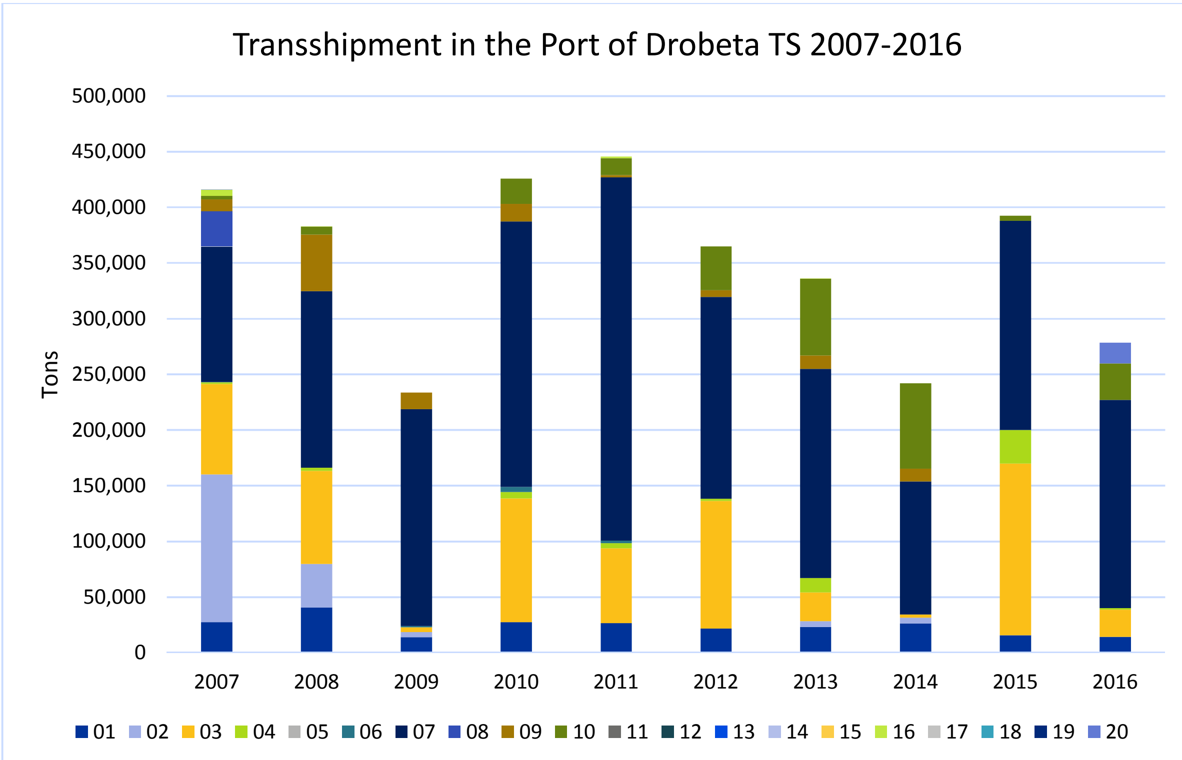

Figure 44: Transshipment in the Port of Drobeta Turnu-Severin 2007 – 2016

(Source: iC consulenten, based on data provided by MPAC)

4.15 Port of Giurgiu

4.15.1 Position

Port of Giurgiu is located on the Danube left side km 489-497. The port is considered to be the port of the TEN-T central network. It is located at the intersection of the Danube River and Corridor IX, which is on the north-south route between the Baltic countries and Bulgaria, Greece and Turkey.

Over the years, the Giurgiu – Ruse (Bulgaria) bridge has been a basic link for rail and road transport services. This crossing point has been registered significant traffic of goods and foreign trucks, representing one of the first 4 Romanian border crossing points for rail freight transport. Giurgiu is also one of the Danube ports close to Bucharest, which gives it geographical significance.

Figure 45: Port of Giurgiu on the Danube River

(Source: www.portofconstantza.com)

4.15.2 Ownership, administration (governance) and operation

Port infrastructure is public property being granted to N.C. Administration of Danube River Ports J.S.Co. Giurgiu, through concession contract signed in 2008. Ministery of Transport is the owner of 80% shares of the Company, the balance of 20% being owned by Fondul Proprietatea.

Another part of the port is administrated by Free Zone Administration, which was established in 1996 in order to develop international trade and to increase the use of regional resources. Between 1996-2004 the organization was under Ministry of Transport and from 2004 become a joint stock company owned by the Giurgiu County Council. Starting 2008 the company is fully owned by Local Council Giurgiu[9].

4.15.3 Infrastructure assessment

In the Port of Giurgiu there are four locations that offer port facilities[10]:

- "Ramadan" commercial port: passenger port and berths for operating cereals, ballast, coal and general goods.
- "Plant Canal / St. Gheorghe": cereals and general cargo.
- Cioroiu port: oil terminal.
- Giurgiu Free Zone: operates general cargo and containers (not in last period), as well as an oil terminal with private administration.

Ramadan sector includes 1100 m with sloped quay with direct access from the waterway and has 3,3 m depths:

---

[9] The Mayor of Giurgiu activity report, 2016, www.primariagiurgiu.ro (in Romanian language)
[10] www.apdf.ro

- 450 m quay – operated by Dunapref for bulk and general cargo;
- 250 m (2 berths) – general cargo;
- 400 m (4 berths) – for passengers;

The is a storage platform of 8,000 sqm and a warehouse with 3,000 sqm.

Traffic capacity: 435.000 tons / year.

Veriga basin is located in km 492 of the Danube, with a length of approx. 1000 m and widths between 120 ÷ 150 m. The access in the basin has a width of 40 ÷ 50 m and the depths 2.5 m. In the Veriga basin there is a shipyard with a synchrolift for 5000 t vessels. Now the basin is a part of Giurgiu Free Zone. Here is the area where use to be operated the ferry-boat Giurgiu-Russe.

Plantelor basin includes 1190 m vertical and sloped quay where bulk and general cargo is operated. The Port of the Plant Basin (km490-492) has access to km 490 through the Smarda Canal, near the Danube Bridge. The distance between the basin and the Danube is 500 m.

The port is a natural basin with mooring fronts with a traffic including bulk cargo for construction, as well as cereals.

The port allows the mooring of barges up to max. 1500 t, having 12 berths as follows:

- a quay of about 400m made of natural stone blocks;
- 2 berths (~ 170 m long) with vertical quays, for aggregates (gravel and quarry products). The key is provided with crane and railway track;
- 170 m (2 berths) for silos;
- 850 m (8 berths) undeveloped quay fronts, which are used for waiting in winter time;
- 170 m from a reinforced concrete structure;
- on the opposite side there is a mooring front with a length of 160 m - ballast docks.

Storage platform has 29,000 m^2 and the annual traffic capacity is 1,320.000 tons.
Cioroiu oil terminal area allows mooring of barges up to max. 2000 t. The access is provided directly from the waterway. The mooring depth is 3,50 m. There is a sloped quay of 680 m. Annual traffic capacity is 550,000 tons.

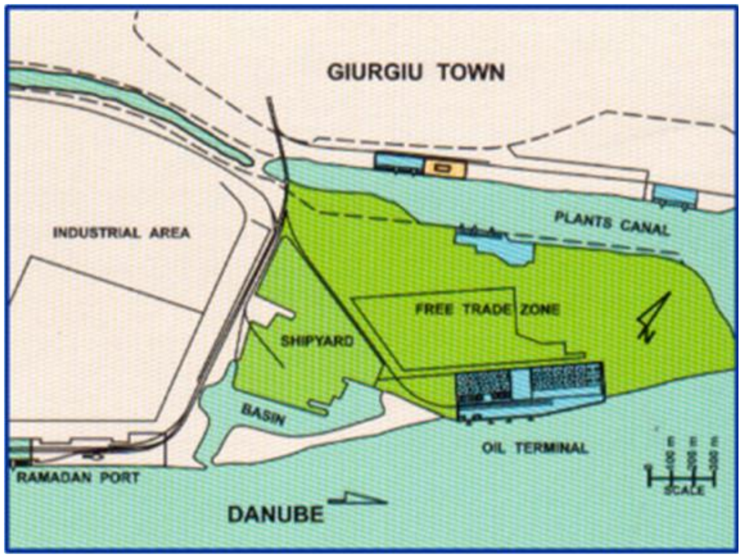

Figure 46: Port of Giurgiu

(Source: www.apdf.ro)

4.15.4 Special infrastructure regarding surface pavement & drainage of rain water

Using the opportunity of POS-T financing programme CN APDF SA Giurgiu implemented during 2012-2015 the project System for taking over and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu (financed under POS-T programme).

The project increased the quality of services for the collection and processing of ship waste and pollution intervention by acquiring ships, installations and equipment, as well as for carrying out the infrastructure works necessary for taking / processing the residues from the river ships through the ports of Moldova Veche, Orsova, Drobeta Turnu-Severin, Giurgiu, Calarasi, Cernavoda being under CN APDF SA Giurgiu administration[11].

Within the project the Port of Giurgiu received a multipurpose collector vessel and a container for solid wastes.

4.15.5 Hinterland connections (road, rail and IWW)

The port of Giurgiu is located 64 km from Bucharest, at the intersection of some important road and rail networks on pan-European corridors IV (Nădlac – Arad – Timişoara – Lugoj – Deva – Orăştie – Sebeş – Sibiu – Piteşti – Bucureşti – Drajna – Cernavodă – Constanţa) and IX (Giurgiu – Bucureşti – Ploieşti – Buzău – Bacău – Roman – Iaşi – Sculeni with exit to Moldova and Russia), as well as the Danube pan-European corridor VII.

[11] www.apdf.ro

The connection to national network is made by European road E70. The connected roads in the area are DJ 504, DJ 507, DN 5, DN 5B, DN 5C.

The railway network in Giurgiu includes two specialized stations: Giurgiu City Railway Station (The main passenger station on Bucharest-Videle) and Giurgiu Nord (transport passengers and goods and control of crossing the border with Bulgaria) connected to the Port of Giurgiu.

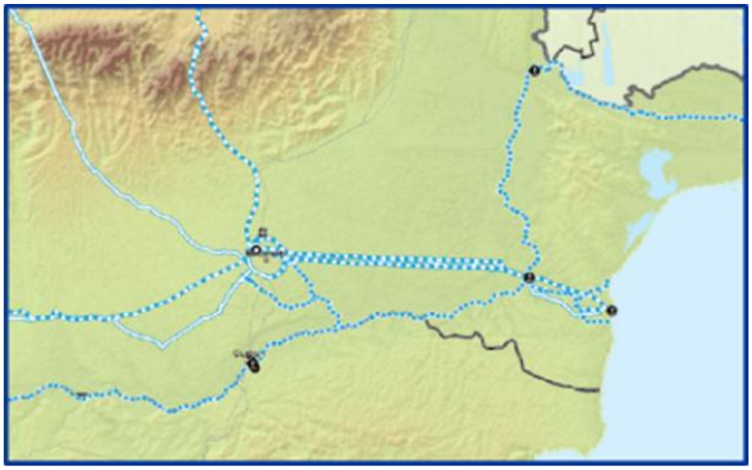

Figure 47: Port of Giurgiu on the Rhine-Danube Core Network Corridor

(Source: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/en/maps.html)

4.15.6 Hinterland (economic situation in the port's hinterland)

The Giurgiu County is not one of the developed in the country. In last period (2012-2016) here was registered the worst economic evolution in Romania (-3% in PIB). But the Port of Giurgiu is focussing on the capital of the country Bucharest and other transit cargo.

In Romania the direct foreign investments increased in 2016 with 22% in comparison with previous year and as expected the Ilfov-Bucharest Region attracted the biggest investments (60% of total at national level).

A very important economic actor in Giurgiu is the steel hub factory where Austrian concern Voestalpine invested 20 mil Euro and intends to extend it in 2017 with other 2 mil Euro (1200 m^2).

In the Giurgiu Free Zone are acting about 120 companies, some of them being involved in production activities such as the photovoltaic panels' factory Altius Fotovoltaic (part of Bomax Group).

4.15.7 Major port users

The main categories of port users are represented by ships' operators, terminal operators, shipyards and other companies involved into goods production, storage or trade.

There is a number of ship operators from the riparian countries, a large part of them having ships registered in Romania, such us CNFR Navrom SA, Metaltrade International, Beo Trade Com, etc.

Port operators in other companies located in Giurgiu Free Zone include[12]:

- Cereal Com SA (owned by ADM) – cereals terminal
- TTS SA – bulk and general cargo operator
- Brise Agricultura SA – cereals terminal
- Mol Romania Petroleum Products SRL – oil terminal
- Borealis L.A.T –fertilizers import;
- OMA Romania S.R.L (Officina Metalmeccanica Angelucci) – metal products;
- Vixon Gold S.R.L – liquefied gases storage and trade;
- Metalurgica Cavatorta S.R.L – welded nets production;
- Holleman Transport & Project Cargo S.R.L – agriculture machinery storage and trade;
- ATG Marina S.R.L – ships building, repairs and maintenance;
- IMSAT S.A – containers production (10", 20" and 40");
- Altius Fotovoltaic S.R.L – photovoltaic panels production;
- Melspring România S.R.L – chemical products production and storage;
- Transporter S.R.L – cereals terminal;
- Sea S.R.L – metal products storage and trade;
- Mistio Impex S.R.L – cement storage and delivery;
- Rhenus Logistics S.R.L – fertilizers, cereals and rolled steel import;
- ILR Logistica Romania S.R.L – rolled steel import;
- M-Food Industrie S.R.L. – storage;
- Shipyard ATG Marina SRL – ships building, repairs and maintenance.

Some important port users are briefly described hereunder[13]:

SCAEP Giurgiu Port

SCAEP Giurgiu was founded in 1991 as a private company whose main field of activity was port operation services. Overtime, the company has offered the following services: freight

[12] The Mayor of Giurgiu activity report -2016, www.primariagiurgiu.ro
[13] *Report on technical and operational status quo analysis,* 2012-EU-18089-S – "High Performance Green Port Giurgiu" Project, Version 0.1 Final, 11th June 2014

transport, ship's agent, loading and unloading operations, grain storage in silos, cargo storage on platforms and warehouses, extracting sand and gravel from the Danube, real-estate rentals.

The company performs its activities in Giurgiu port at two locations:

- The Ramadan berth with a length of 250 m which has direct access to the Danube, having a grain silo with a capacity of 6.000 tons, a 60-ton weighbridge used when receiving grain into the silo and equipment to load grains in barges.
  - The storage available: 3.600 m^2 platform, 600 m^2 covered. Operating equipment: 1 quay crane: 5 t x 32 m, 1 quay crane: 16 t x 32 m.
  - The access to the berth can be made by rail or road.
- The berth in the Plants 'channel with a length of 250 m, 2 quay crane: 5 t x 32 m, storage platform: 5.500 m^2, mini front stacker, front stacker, 1 forklift 3.5 to.

DUNAPREF SA *(www.dunapref.ro)*

The company is specialized in precast wares made of reinforced concrete designed for railways, roads and bridges and extracting ballast from the Danube. The company is located in the port area and it has access to the waterway, to the road network and to the railways.

Dunapref has its own Danube quay and equipment allowing it to load and unload cargo transferred on the waterway. Furthermore, the company also has the equipment needed for extracting and processing Danube ballast.

Com Cereal SA (owned by ADM) (*www.adm.com*)

The ADM company is one of the top 3 grain trader, registering in Romania revenue of approximately 300 million Eur. ADM is involved in international trade with agricultural products and it owns the silo along Sf. Gheorghe area. The company has developed a number of investments along the entire Romanian Danube stretch planning to reach a network of 12 silos.

ILR Logistica Romania SRL (owned by Industrie-Logistik-Linz GmbH) (*www.ilr.com.ro)*

The company is active in the field of logistic services, providing facilities along the whole supply chain. Its main area of expertise is industrial logistics, but it should also be considered as a full service provider for logistics.

ILR Logistica Romania is one of the partners of the project *High Performance Green Port Giurgiu,* which in the *Stage II* [14] will include the building of a trimodal logistic center.

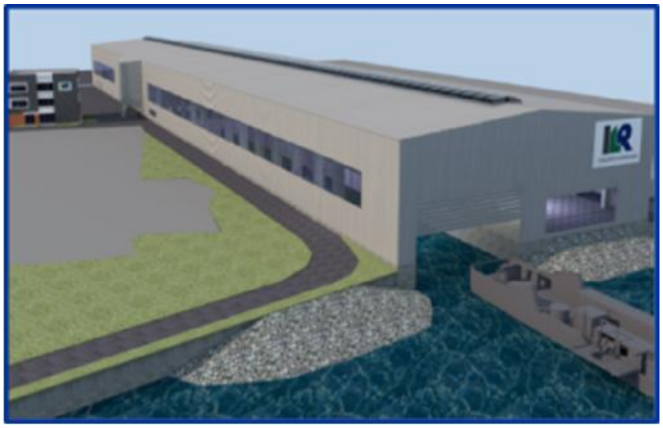

Figure 48: 3D Model for trimodal logistic center to be developed in Giurgiu through High Performance Green Port Giurgiu Project

(Source: www.ilr.com.ro)

S.C. MOL ROMANIA PETROLEUM PRODUCTS S.R.L (owned by Mol Group) *(www.molromania.ro)*

The terminal covers an overall area of 15.000 m^2 and the deposit has direct access to the waterway, thus making use of inland navigation as a transportation mode. Having a deposit with an overall working capacity of 7.000 m^2 the terminal is planned to operate yearly 70.000 tons of gasoline and 130.000 tons of diesel fuel.

Melspring Romania (owned by Olmix) *(www.melspring.com)*

The company is part of the French Olmix group and is responsible for distributing Olmix products for the nutrition and health of livestock.
The company is also involved in activities associated to the cement industry.

The Romanian subsidiary is responsible for producing and trading ferrous sulphate and heptahydrate that can be used in the following fields: cement production industry, treatment of industrial waste water, animal nutrition, agricultural purposes – fertilizers, horticulture, viticulture.

[14] *https://ec.europa.eu/inea/en/connecting-europe-facility/cef-transport/projects-by-country/romania/2014-ro-tmc-0313-w*

Shipyard ATG Giurgiu *(www.shipyardatg.ro)*

The shipyard provides new construction and repairs for both shallow and deep water vessels around the world. The Shipyard has been operating since 1897, subsequently owned by a Romanian business investor in 2002. It has a steel manufacturing capacity of up to 600-700 ton/month, approximately 10.000 tons per year.

It is working in accordance with ship class rules BV/DNV-GL/LR, the ruling environmental requirements under ISO 14001 standard, quality management system under ISO 9001 standard, being certificated by Bureau Veritas.

4.15.8 Potential port users

The latest developments in the Free Zone proved the need for the port to focus on addressing all the companies operating in the area as future potential users. The new trimodal terminal which will be developed through the project *High Performance Green Port Giurgiu - Stage II* will provide the missing links with road, rail and inland waterway networks[15].

The development and implementation of the supply chain system within the intermodal terminal will open to the port opportunities to address new port users.

4.15.9 Planned industrial and economic developments in the port's hinterland

There are expected new investments in the area, but also in the Ilfov-Bucharest region, the most dynamic one in the country.

Accoring to data published by the Social Monitor (Project Friedrich Ebert Siftwung) at the end of 2015 the Bucharest-Ilfov was the region by far the most developed in Romania, as a GDP / capita 131% of the European average. This makes Bucharest in a position over other European capitals that have a lower GDP / per capita: Athens (98%), Madrid (128%), Berlin (113%) or Budapest (108%). There is expected a relevant economic growth in the region.

The very good road (highway A2) and rail connection Bucharest – Constanta Port and the need of infrastructure improvement in Giurgiu is not giving at the moment for the Port of Giurgiu a good position in addressing Bucharest as own hinterland.

4.15.10 Cargo statistics

The Port of Giurgiu is the second port as traffic (after Calarasi) out of ten ports administrated by N.C. Administration of Danube River Ports J.S.Co. Giurgiu, but having a very dynamic development. During the year 2016 the throughput of the port was 807,226 tons, almost a quarter of the all ten ports.

[15] Please see section 5.2.2 for the description of the project.

The evolution of the traffic in last ten years started from about half million tons operated in 2007 and 2008, decreasing due to the economic crisis in 2009-2012 and recovering during the last years.

As a result of the investments made in the Free Zone during the last period, the traffic has steadily increased. The main types of cargo whose visibly increased traffic is petroleum products (126,644 tons in 2016), cereals (217,037 tons in 2016) and fabricated metal products (125,897 tons in 2016).

Please see Annex II for detailed data related to cargo type and operated volumes.

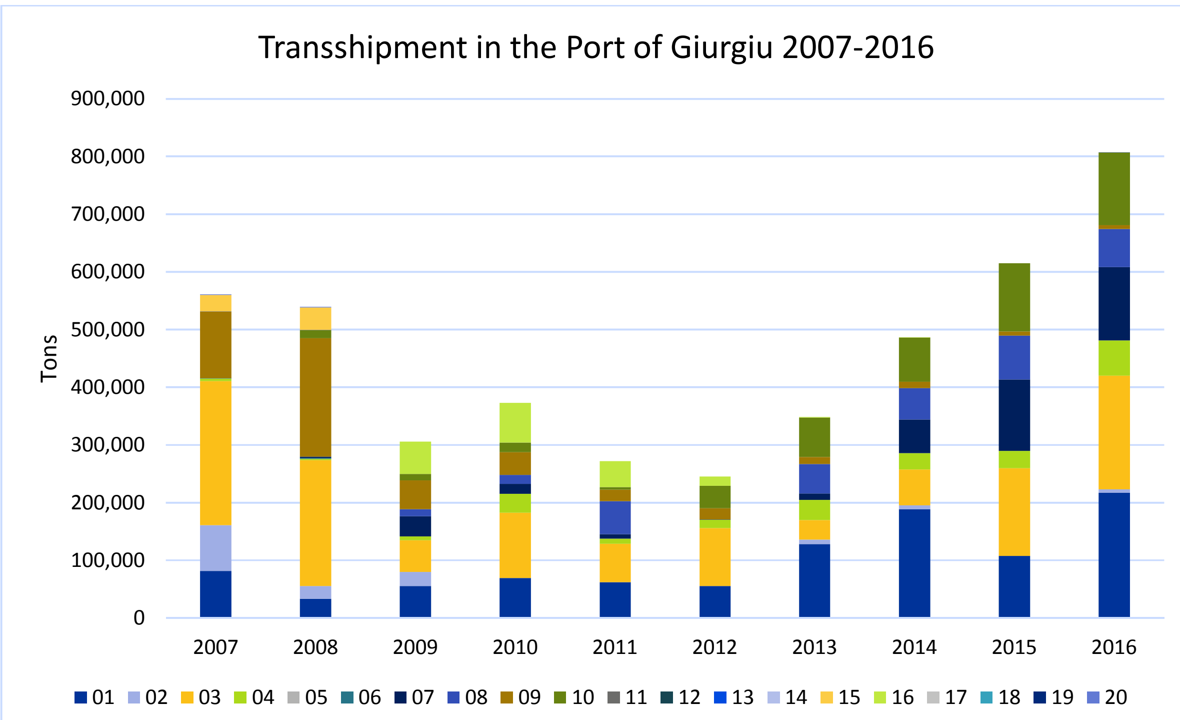

Figure 49: Transshipment in the Port of Giurgiu 2007 – 2016

(Source: iC consulenten, based on data provided by MPAC)

4.16 Port of Galati

4.16.1 Position

Galati County is located in the eastern part of Romania, in the southern most point of Moldova's plateau. Located on the left bank of the Danube, it covers an area of 246,4 km², at the intersection of Siret river (in the west) and Prut river (in the east), near Brates lake, at about 80 km distance from the Black Sea. The nearest city is Braila, located at 15 km to the south.

Position: Lat. 45° 25' N   Long. 028° 05' E

Figure 50: Port of Galati

(Source: APDM)

The city of Galati is among one of the biggest economic centres in Romania. The economic environment has developed around the ship yard, the port, and the *Arcelor-Mittal* steel plant. The communities in the area have been deeply influenced by the Danube, the second longest European river (2.850 km), with an average discharge on this sector of 6.199 cu m/s, after it merges upstream with Siret river with an average discharge of 210 cu m/s (the biggest tributary on the Romanian Danube stretch).

The river continues on its path to the Black Sea after it merges upstream of the port in Galati with Prut river, with an average discharge of 86 mc/s. The Danube's discharges vary greatly, depending on the season and the year, reaching top values in may (18.000 - 19.000 cu m/s) and bottom level in summer (2.000 - 2.450 cu m/s). Due to the considerable water depth up to the area around Braila, the Danube is declared as maritime.

The vessel construction industry, enriches the river and maritime fleet with vessels of up to 65.000 dwt (barges, bulk carriers, push-tug boats, oil tankers) and sea drilling platforms.

The city of Galati is one of the most important Romanian commercial hubs as it is connected to the main European corridors - the Rhine-Maine-Danube canal connecting the North Sea to the Black Sea; the railways make the transition from large gauge tracks specific to the former

Soviet Union countries to normal gauge; Galati Free Zone is a strategic point in the eastern part of the city, on whose territory all of the above communication means specified: road, railways and river.

Galati, located on the left bank of the Danube, 80 Km away from the Danube Delta, has 4 ports, one for passenger transport and three for cargo transport. Galati is Romania's second important port, having the possibility to connect to the Black Sea; it is located on the maritime stretch.

Port of Galati is the biggest Romanian river-sea port, located on the left bank of the Danube river, between Km 157+600 and Mm 78+1300. It has 4 anchorage areas, near the right bank of the Danube river, as follows:

- Mm 76,0 ÷ Mm 78,5 - sea-going & river vessels
- Mm 80,0 ÷ Km 150,0 - non-propelled vessels, without crew on board
- Km 155,0 ÷ Km 158,0 - sea-going & river vessels, including barges
- Km 158,2 ÷ Km 159,3 - empty river vessels

Port of Galati consist of 4 terminals, as follows:

1. Mineral Terminal: Km 155,40 ÷ Km 157,60
2. Commercial Terminal: Km 149,35 ÷ Km 151,00
3. Docks Terminal: Mm 80,00 ÷ Km 149,35
4. New Basin Terminal: Mm 78+1300 ÷ Mm 79+700

1. Mineral Terminal is specialized in loading and discharge of bulk cargos and also steel rolled products. Its building started in the end of 60's and the terminal started to be used in the early 70's.

Figure 51: Mineral terminal in the Port of Galati

(Source: APDM)

<u>2. Commercial Terminal</u> – Located on the left bank of the Danube, between km.151 – Nm 80,5.

Figure 52: Commercial terminal and Port Authority in the Port of Galati

(Source: APDM)

3. Docks Terminal – Located between Nm. 80 and Nm. 80,5 on the left bank of the river. General cargo is operated in the port. The maximum capacity of ships that have access into the port: river and sea-going vessels of up to 4500 tdw.

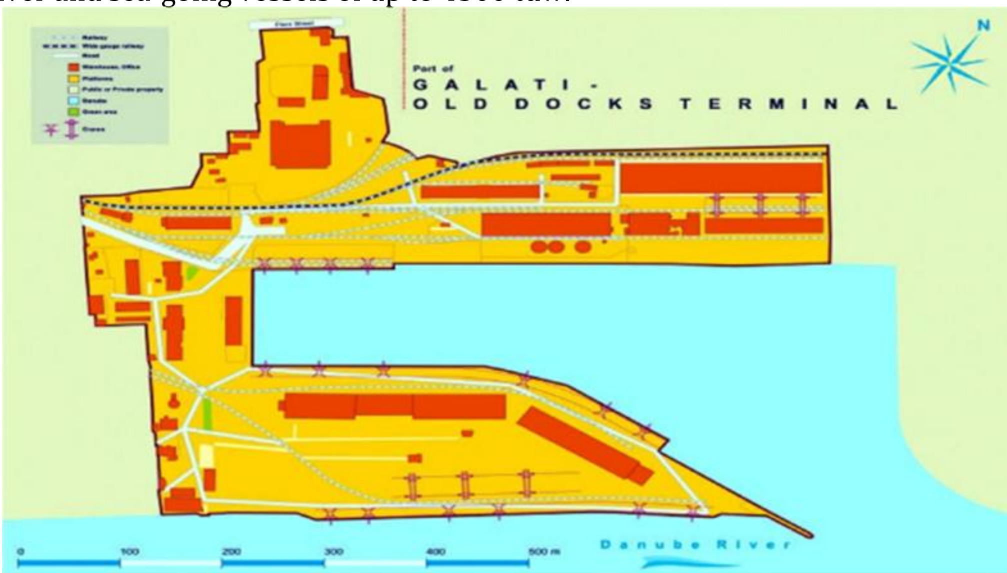

Figure 53: Docks terminal in the Port of Galati

(Source: APDM)

4. New Basin Terminal – Located between NM. 79,4 and NM. 78+1300 (the area downstream from Damen Shipyard Galati).

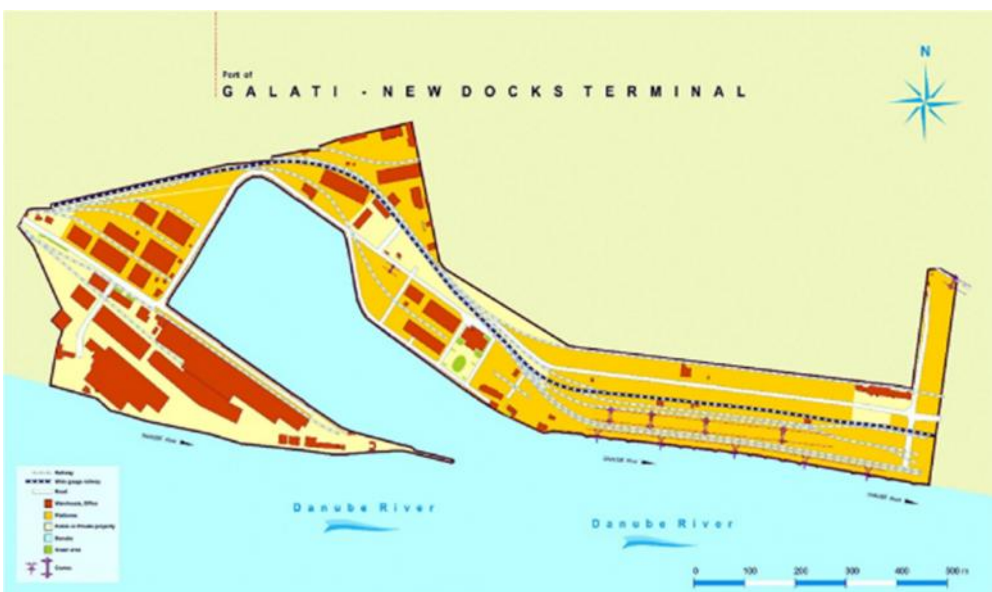

Figure 54: New basin terminal in the Port of Galati

(Source: APDM)

4.16.2 Ownership, administration (governance) and operation

Land and infrastructure are owned by the Romanian state. The governance and the administrative obligations are made by the National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati).

The National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati) fulfils the function of Port Authority and the quality of Port Administrator in the sea – river ports located on the Romanian river-sea stretch of the Danube.

4.16.3 Infrastructure assessment

- Total area: 864.131 sqm
- Number of basins: 2 (Docuri) (Bazinul Nou)
- Quay Length: vertical=4.675 m; sloped=2.390 m
- Number of berths: 56
- Winter harbor
- Rail connection: length=12.348m (European gauge)
- Large gauge along the operating berths
- Rail tariff point
- Connection to the national highways
- Parking places for trucks
- Cargo storing facilities (open and covered storing areas)
- Port equipment for vessel operation
- Cereal silos
- Waste collection from the ships: garbage, used and bilge water
- Bunkering facilities
- Ship maintenance facilities
- Free Zone
- Custom office
- Shipyard
- Cereal Terminal
- Container Terminal
- Oil Terminal
- Security standards according to the ISPS code.
- Assistance services for the transshipment of oil products in the specialized berth.

Table 8: Characteristics of berths in the Port of Galati

Berth No.	Length (m.)	Depth* (m.)	Size (d.w.t.)	Open Storage (sq.m.)
Mineral Port:				
1–16	2,000	4.0–7.3	3,000–25,000	44,380
Old Commercial Port:				
7–13, 15–22	1,540	3.5		8,220

Berth No.	Length (m.)	Depth* (m.)	Size (d.w.t.)	Open Storage (sq.m.)
Docuri Basin:				
23–33	1,540	6.5	8,000	38,100
New Basin:				
36–50	1,980	6.0	8,000	167,730
* LW				

(Source: APDM)

The maritime quays are provided with conveyor belts. One conveyor belt for river vessels at Berths No. 46–50. Galati Free zone located at Berths No. 51–53. At Berths No. 39–44 loading/discharging is by ship's gear.

Table 9: Capacities in the Port of Galati

Cargo	Operation	Thousands of tons per Ship per Day Vessel Capacity (Tons)					
		Up to 600	601-1500	1501-3500	3501-6000	6001-15000	Over 15000
Iron Ore	Belts				4.0	7.5	10.0
	Direct transshipment	1.2	1.5	1.7	2.0	3.0	3.6
Coal	Belts				4.0	5.0	7.0
	Direct transshipment	1.0	1.5	1.7	2.0	3.0	3.6
Coke	Belts				2.5	3.5	
	Direct transshipment	0.8	1.0	1.2	1.5	2.6	
Phosphates	Direct	0.7	1.0	1.2	1.5	2.6	
Cereals	Silo installations	1.0	1.5	1.6	1.8	1.8	
	Direct transshipment			1.0	1.3	1.5	
Cereals	Silo installations	0.6	0.6	0.6	0.8	0.9	
Dry timber	Floating cranes	0.7	0.8	1.0	1.3	1.8	
	Cubic metres		0.6	0.9	1.2	1.3	
	Miscellaneous	0.3	0.5	0.7	0.8	0.9	
Paper		0.3	0.4	0.5	0.7	0.8	
Steel		0.6	0.7	1.0	1.3	1.6	1.9
Miscellaneous		0.7	1.0	1.5	1.7	2.0	

(Source: APDM)

Mineral Terminal

Has 1.700 m quay along the Danube river, equipped with 26 portal cranes 5tf x 32m, "KANGOROO" type and 18 shore cranes 16tf x 32 m.
Mineral Terminal has 16 specialized berths as follows:

Berths 1 ÷ 4 [River vessels]
- vertical quay, allowing direct mooring of river vessels
- length: 400 m
- depth: -2,0 ÷ -4,0 m

- quay quota: +9,46 m

Loading/Unloading facilities:

- 8 portal cranes BOCŞA 16 t / 32 m with gauge of 15,30 m

On the platform behind the quay is a warehouse.

Operating technology: The quay machine discharges limestone from the barges onto the storage platform from which the machines removed the deposit on the belt conveyors.

Ships characteristics: Barges up to 3.000 tons.

Storage space: 16.000 sqm

Access: Road & Rail

Berths 5 ÷ 6 [Sea-going vessels]

- vertical quay, allowing direct mooring of sea-going vessels
- length: 400 m
- depth: -9,0 m
- quay quota: +9,46 m

Loading/Unloading facilities:

- 2 conveyor belts
- 11 portal cranes KANGUR 16 t / 32 m with gauge of 15,30 m

Operating technology: The quay cranes discharge the cargo directly on the belt conveyors or onto the storage platform from which the same cranes removed the cargo on the belt conveyors.

Ships characteristics: Sea-going vessels up to 25.000 tons.

Storage space: 4.380 sqm. It's used only when the direct reloading of the cargo from vessels on the conveyor belts is not available.

Access: Road & Rail

Berth 7 [Sea-going vessels]

- vertical quay, allowing direct mooring of sea-going vessels
- length: 200 m
- depth: -9,0 m
- quay quota: +9,46 m

Loading/Unloading facilities:

- 1 conveyor belt
- 4 portal cranes BOCSA 16 t / 32 m with gauge of 15,30 m

Operating technology: The quay cranes unload the cargo directly on the belt conveyors or onto the storage platform from which the same cranes removed the cargo on the belt conveyors. The quay cranes also load the vessels with steel products, from the existing concrete platform.

Ships characteristics: Sea-going vessels up to 25.000 tons.

Storage space: 12.000 sqm. It's used only when the direct reloading of the cargo from vessels on the conveyor belts is not available.

Access: Road & Rail

Berth 8 [River vessels]

- vertical quay, allowing direct mooring of sea-going vessels
- length: 200 m

- depth: -5,0 m
- quay quota: +9,46 m

Loading/Unloading facilities:
- 4 portal cranes BOCSA 16 t / 32 m with gauge of 15,30 m

Operating technology: The quay cranes unload the cargo directly on the belt conveyors or onto the storage platform from which the same cranes removed the cargo on the belt conveyors. The quay cranes also load the vessels with steel products, from the existing concrete platform.
Ships characteristics: Sea-going vessels up to 25.000 tons.
Storage space: 12.000 sqm. It's used only when the direct reloading of the cargo from vessels on the conveyor belts is not available.
Access: Road & Rail

Berths 9 ÷ 15 [River vessels]
- vertical quay, allowing direct mooring of river vessels
- length: 700 m
- depth: -5,0 m
- quay quota: +9,46 m

Loading/Unloading facilities:
- 3 conveyor belts
- 9 portal cranes KANGUR 16 t / 32 m with gauge of 15,30 m

No storage platform behind the quay.
Operating technology: KANGUR cranes have a bunker mounted under the portal. With the crane gripper, the coal is removed from the ship and unloaded into the bunker, and from here it spills directly onto the conveyor belt.
Ships characteristics: Barges up to 3.000 tons.
Storage space: 0 sqm
Access: Road & Rail

Berth 16 [River vessels]
- vertical quay, allowing direct mooring of sea-going vessels
- length: 100 m
- depth: -5,0 m
- quay quota: +9,46 m

Loading/Unloading facilities:
- 2 portal cranes KANGUR 16 t / 32 m with gauge of 15,30 m

No storage platform behind the quay.
Operating technology: The quay cranes unload the cargo directly on the belt conveyors or onto the storage platform from which the same cranes removed the cargo on the belt conveyors. The quay cranes also load the vessels with steel products, from the existing concrete platform.
Ships characteristics: Barges up to 3.000 tons.
Storage space: 12.000 sqm. It's used only when the direct reloading of the cargo from vessels on the conveyor belts is not available.
Access: Road & Rail

4.16.4 Special infrastructure regarding surface pavement & drainage of rain water

No information available due to the fact that this topic it's not the responsibility of the port administration. Drainage of rain water systems are part of the construction systems for each port platform and all these platforms are owned by the private port operators.

It's their responsibility to keep them functional and also it's their responsibility to conclude the contract with local water company for collecting the rain water.

4.16.5 Hinterland connections (road, rail and IWW)

Galati is one of the biggest commercial traffic hubs in Romania, connected to main European communication channels. It is located close to the border with Moldova and Ukraine. Railways ensure the transfer from the European standard gauge to the broad gauge used in the former URSS countries, while the access to the Rhine-Main-Danube Channel, which connects the North Sea to the Black Sea is done by water way.
The distances are:

- Road for transit operations - between Mm 80 and Mm 79 on the right side;
- Road where Seagoing vessels are waiting at anchor is downstream from Mm 79 to Mm 77;
- Rail connection: length = 12,348m (European Gauge).

4.16.6 Hinterland (economic situation in the port's hinterland)

The County of Galati has an industrial-agricultural based economy. The industry and services are mainly concentrated in the urban centers, while the rural areas are mostly engaged in agricultural activities. The statistics regarding the number of traders located in the urban areas of the county show that most of them – 86% - carry out their activities in Galati.

It is also important to mention the high percentage of commerce activities and the low number of units which carry out their activities in industry, constructions and agriculture. This situation varies from year to year.

In the national economy, Galati County is the main hot metal, steel products and the second producer in the country in what regards the production of maritime ships.

The main industrial sectors are metallurgy and naval constructions.

The metallurgical industry in Galati, represented by the ArcelorMittal Steel Plant, accounts for 55,6% of the country's total steel production, 55% of the laminated production and 90,5% of the plates and cold rolled coils production. More than two thirds of the metallurgical production is exported.

The naval industry, represented by Damen Shipyards Galati, has a vast tradition in the city and supplies the fluvial and maritime fleet with ships up to 65,000 dwt (barges, bulk-carriers, ore ships, tugs, oil tankers) and offshore oil platforms.

Port of Galati is the largest river and sea port on the Danube and the second largest Romanian port. Located in Galati, the port is an important source of incomes for the city, as it attracted many national and international companies operating here.

These include:

- The Dutch company, Damen Group, which owns the shipyard Galati, with shipbuilding activity
- ArcelorMittal, the largest integrated steel plant and the leader of steel products
- Metaltrade Int'l - Port operations through SC Bazinul Nou SA and SC Docuri SA.

Used in agriculture activities, Galati county has 358.456 ha, out of which 289.800 ha represent arable land, 42.771 pastures, 548 ha hay lands, 23.050 ha vineyards and root stock nurseries and 2.287 ha orchards. The county also has 44.881 ha forests and other lands with forest vegetation, 13.047 ha water surfaces and ponds, as well as 30.278 ha representing other surfaces.

Therefore, the agriculture has the benefit of a series of natural resources, which if used properly, can play an important role in the economic and social development of the county. Agriculture is also an important sector for the regional economy: about 40% of the occupied population works in this sector, which adds 16% to the regional GDP.

The lands that are cultivated have the potential to develop further in the future and here we have to mention the vegetable growers in Tecuci and especially those in Matca, who are famous across the country and even in Europe, the vegetable growers in Galati (Badalan and Vanatori areas) and the agricultural exploitations which have been achieving great results for many years, both in what regards the vegetable production and zoo technical production.

4.16.7 Major port users

SC Port Bazinul Nou SA is the biggest port operator on the Danube river and provides forwarding and freight services for a wide variety of products.

It's main business hub is located in the maritime sector of the Danube river, on the left of 79th's marina mile, near to the state border with the Moldova Republic and Ukraine, near to the Customs' Free Zone of Galati city.

By its geographical position, the company is an important strategic point, which provides the connection between the former CIS and Europe.

The Docks Terminal was built in the last decade of the 19th century (1886 - 1892) and is the 3rd largest and important terminal in Galati. It is operated by **SC Docuri SA**, member of **Metaltrade Int'l Group**.

It's main business hub is located on the left bank of the Danube, 80 nautical mile and offers a wide range of port services, taking into equipment storage capacities, mechanical handling, lifting, transport and handling of goods, specializing in bulk and grain traffic .

In September 2008 opened the first Container Terminal.

The Mineral Terminal is located on the left side of the Danube, between km 157 + 600, down of the water source of Galati and km 157 + 400, upstream of Galati.

SC Romportmet SA is a very modern river-maritime port operator on the Danube, specialised services provider, with a handling capacity of app. 20.000.000 tons/year.
It's part of Arcelor Mittal Group.

The traffic within the port, of receiving raw materials and dispatching steel products, is performed with maritime vessels as well as with river vessels. For the course of materials traffic , the port is endowed, consequently, with special equipment for operating the vessels, storage, transfer, receiving and despatching of materials towards and from Arcelor Mittal Galati steel plant.
Galati docks silo, placed on the left bank of the Danube at km 150.

TransEuropa Port SA has acquired at the end of 2006, a grain silo with a total capacity of 25.000 tons (based on wheat), having many facilities.

Placement offers, through the road and railroad networks, connection throughout the country, also throughout Moldavian Republic and implicitly the Russian Federation and Ukraine.

Galati harbour docks silo specializes in grain operating, with a possibility of storage and transit from wide path wagons to normal path wagons and vice versa. Vessels/barges Loading/unloading procedures are carried out at berths 31 and 32 from Galati harbour docks (ships up to 7000 tons may be operated depending on the water level of the Danube).

SC Unicom Oil Terminal SA is as a joint stock company with private foreign capital amounting to Euros 3.5 million, which is invested in the company's infrastructure, allowing it to provide services both for Romanian and foreign firms operating in the chemical and oil industries.

The company is located within the Bazinul Nou Port, Pier 54 – Galati, with a frontage to the maritime channels of the Danube River, where it holds two operational docks and a third one under construction.

The location covers an area of 50.000 sqm and is connected to a flexible European railway, specific to the CIS countries, which operates on the border checkpoint with the Republic of Moldova and Ukraine.

4.16.8 Potential port users

The entire available land, all platforms, storage areas and warehouses located within Galati Port area are rented to private operators.

It is up to port operators and their commercial and business strategies to bring additional traffic flows in the port and/or to increase the existing traffic of goods.

Each year the port administration requires port operators to provide the traffic forecast or to update it (if exists) and establish with all port operators' companies the minimum traffic that have to be handled in the next year.

This activity is mentioned as mandatory in the renting contracts concluded with all port operators

4.16.9 Planned industrial and economic developments in the port's hinterland

In order to develop the port activity APDM is the lead partner of the project "Galati Multimodal Platforms - Stage I – Upgrading of the waterside infrastructure" which is the first stage of the project "Multimodal Platform Galati – Removing major bottlenecks by substantially upgrading existing infrastructure and bridging missing links for the Rhin - Danube / Alpine Core Networks Corridor" and aims to upgrade the waterside infrastructure of the port of Galati – New Basin Port area, located within the port of Galati.

It is co-financed by the European Union, started on August 2016 and is about to be finished on March 2020.

4.16.10 Cargo statistics

Galati is the second largest port in Romania, being considered one of the main ports of the TEN-T network. Port of Galati operates grain, aggregates, steel, iron ore, coal and scrap iron. However, the lack of multimodal facilities is a major obstacle to aligning port logistics to international transport flows.

In addition, port infrastructure and triage areas are old and inadequate for modern logistical needs, and links to national roads and rail transport networks are slow and inefficient.

All these factors limit the volume of goods operated in Galati Port, which has led to the reduced use of the port at present.

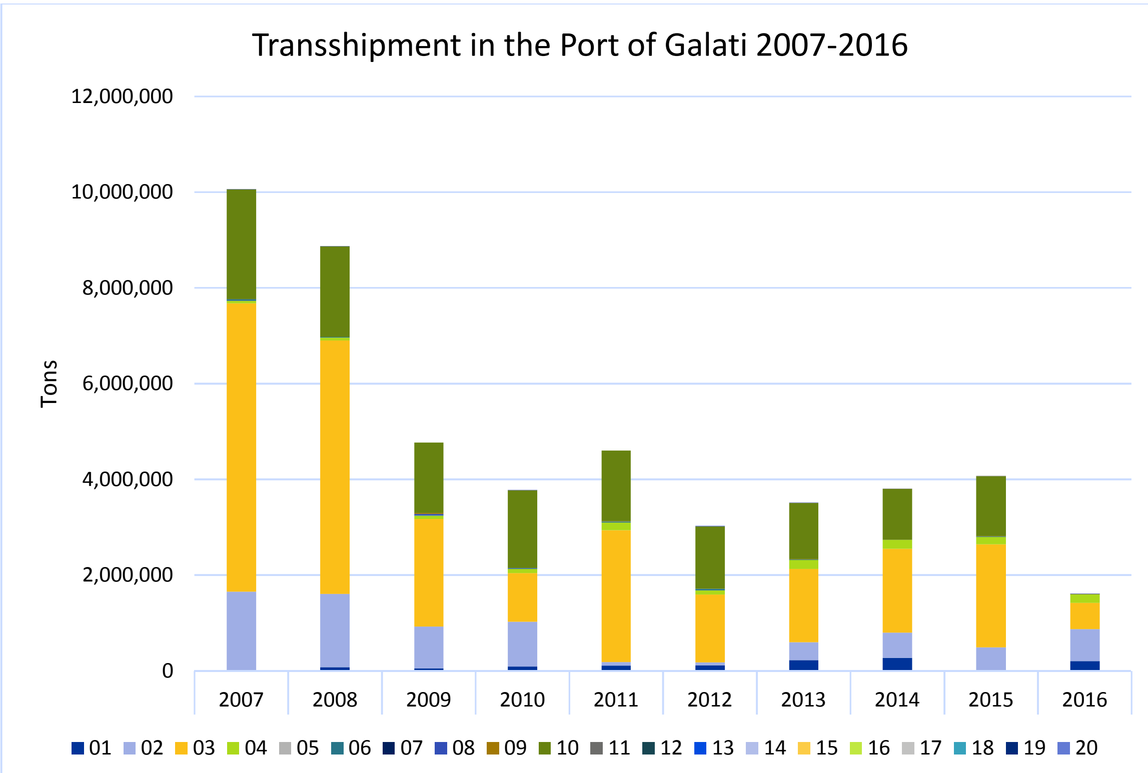

Figure 55: Transshipment in the Port of Galati 2007-2016

(Source: iC consulenten, based on data provided by APDM)

4.17 Port of Braila

4.17.1 Position

Port of Braila is the second river port of the Danube, situated west of the Danube Delta between Km. 168 and Km. 175,5 upstream from Sulina, 19,2 km from Galati.

Figure 56: Port of Braila

(Source: APDM)

Braila is located on the left bank of the Danube and has been a port city for a long period of time and it has a complex profile including food products, timber, construction materials, equipment, etc.

Position: Lat. 45° 15' N Long. 027° 59' E
Braila Port is a river and maritime port, located on the left bank of the Danube river at km. 170. It is the second biggest Romanian sea-river port after the Port of Galati.

Port has two locations:
1. The old area of Braila Port – Located between km. 170 + 875 and km. 168 + 300;
2. The Docks basin Braila – Located downstream from km. 169.
Downstream from km 171 the CN APDM SA Galati –Braila Office- Berth 18 - PA 181 is to be found.

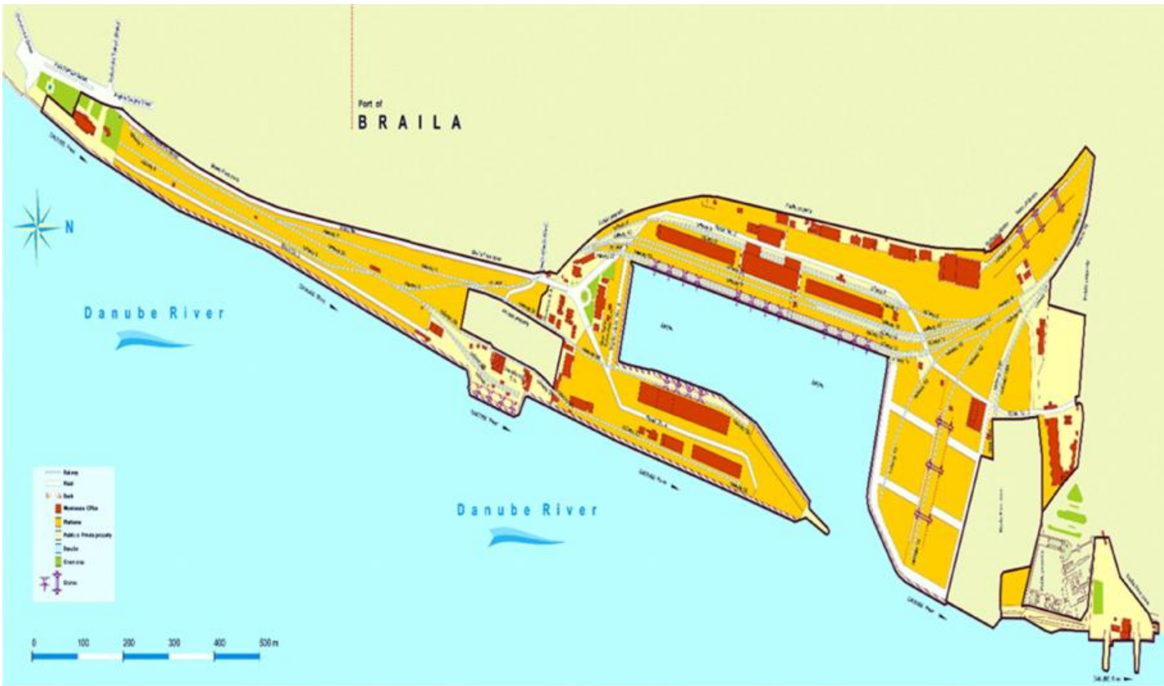

Figure 57: Layout of the Port of Braila

(Source: APDM)

4.17.2 Ownership, administration (governance) and operation

Land and infrastructure are owned by the Romanian state. The governance and the administrative obligations are made by the National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati).

The National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati) fulfils the function of Port Authority and the quality of Port Administrator in the sea – river ports located on the Romanian river-sea stretch of the Danube.

4.17.3 Infrastructure assessment

Port has both basin and river berths and handles general cargo and bulk. Load/discharge operations can be performed by ship's gear or shore gear.

Bunkers are available from the specialized berth and also by truck by prior arrangement through Agent. It is possible to supply any quantity.

Vessels can be stored by barge or truck. Vessels can be stored during cargo operations. Trucks can proceed alongside at the berth. Forklift trucks can be used on the berth to handle stores. Customs regulations are in force regarding storing. Local riggers may be employed to assist with storing.

- Total area: 398.630,13 square meters
- Number of basins: 1
- Quay length: vertical=797 m, sloped=2.506 m
- Number of berths: 25
- Winter harbor
- Rail connection
- Large gauge along the operating berths
- Rail tariff point
- Connection to the national highways
- Cargo storing facilities (open and covered storing areas)
- Port equipment for vessel operation
- Cereal silos
- Free Zone
- Customs office
- Shipyard
- Cereal Terminal
- Ship maintenance facilities
- Cleaning the storing facilities
- Cleaning oil tankers.

The commercial port sector (Km. 168–175) has depths 11,1–25,0 m. and accepts vessels 500 – 9.000,00 d.w.t.

Draft is limited to 7,01 m. by the Sulina Bar.

Table 10: Characteristics of berths in the Port of Braila

Berth No.	Length (m.)	Location	Cargo
34–38	550	Basin	General
20, 23, 24, 27	700	River bank	General, cereal
17, 18, 19	75		Bulk
31	100	Basin	Bulk
32	110	Basin	Bulk
20, 22, 23	175		Bulk
24	100		Bulk
27	175		Bulk
34–38	110		Bulk
41	110		Bulk
46	100		Bulk

(Source: APDM)

Table 11: Berths handling capacities in Braila

Berth No.	Cranes (No.)	Capacity (tonnes)
23–24	2	6.3
34–38	3	16.0
	5	6.3
46	2	6.3

(Source: APDM)

Cargo handling facilities: According to type of cargo and loading capacity of the vessel.

Table 12: Handling rates in the Port of Braila

Cargo	Rate (tons/day)
Metallurgical products:	700,0 – 1.000,0
Cereals:	800,0 –1.000,0
General cargo in bags:	400,0 – 600,0
Bulk cargo:	1.200,0 – 1.500,0

(Source: APDM)

4.17.4 Special infrastructure regarding surface pavement & drainage of rain water

No information available due to the fact that this topic it's not the responsibility of the port administration. Drainage of rain water systems are part of the construction systems for each port platform and all these platforms are owned by the private port operators.

Port operators are responsible to keep them functional and also it's their responsibility to conclude the contract with local water company for collecting the rain water.

4.17.5 Hinterland connections (road, rail and IWW)

Braila Port has different ways of connections to hinterland by railway - length = 1.481 m, wide track gauge - along operating docks, rail charging point and road - connection to the national road system. The distance to the motorway is for 1 km.

4.17.6 Hinterland (economic situation in the port's hinterland)

The economy of Braila County has a predominantly agrarian character, thanks in the first place to the large area of agricultural land (336.672 hectares of arable land, 34.417 hectares grasslands, 380 hectares of vineyards, 1.457 hectares of orchards, 8.352 hectares of vineyards).

Over time, industrial units have been built and the workforce has been trained in various fields: chemical industry, textile industry, food industry, woodworking, machine and machine industry.

Among the industrial activities of the municipality of Braila with relevance are: garments, metal constructions, metallurgy, machinery and equipment, production and distribution of electricity, food and beverages, furniture and furniture items, etc.

4.17.7 Major port users

SC Hercules SA is a company with private capital which develop its activity in Braila harbour, as port services operator, loading/discharging in/from both maritime and river ships, storing general cargoes on platforms and warehouses of their own.

Owns transport capacities (schleps, barges cover and open), pushers and tugs from 600 HP up to 2700 H.

Located on km. 171, Braila Harbour has a basin with the length of 550m and width of 145m. On the length of 550m, the quay is vertical.

The harbour also has:

- 9 maritime berths
- 29 river berths
- 16 waiting berths

Braila Harbour has quay cranes of 5 tf and 16 tf, 2 bridge cranes, floating cranes, storage platforms, for goods on a surface of 246 000 m2, a grain silo of 6800 tons and floating cranes. Railways, roads, electricity, fresh water and fire-fighting water networks are available in Braila Harbour.

The minimum water level insured in Braila Harbour is 23 feets (7,01 m) and at higher levels of the Danube, vessels up to 10.000 dwt have access (the minimum level depends on the Danube level).

Trans Europa Terminal located in Braila Harbour - Sea-river port located on the left bank of the Danube, at km 170, dockside access being made directly from the fairway.

Braila harbor has two berths with a vertical quay and two waiting berths allowing handling sea and river vessels up to 10.000 dwt.

- Berth no. 22 – composed of 2 dragnets of 95,41 m long placed end to end and Tiglina barge with a length of 40,41 m
- Berth no. 23: 100 m
- Berth no. 24: 104 m
- Berth no. 25: 60 m

Trans Europa Terminal is equipped with:

- Quay cranes of 5 t each, necessary for manipulation any kind of merchandise, in direct transshipment (river vessels – sea vessels, railroad wagon – sea/river vessels, auto transport – sea/river vessels)
- 12 tf Crane on wheels
- 3 fertilizer bulk bagging plants for loading in 500/600kg bags
- Mobile loading system for ships (ship loader)
- Electronic Scale for vehicles up to a max of 60 tons
- Possibility of temporarily storing cargo in warehouse barges with tight lids
- Maneuvering pushers
- 2 railroads for operation with a total length of 468 m
- Two bunkers for bulk cargo loading for railroad or auto transport
- Platforms for cargo storage of 10.000 m2
- Pavilion warehouse with an area of 1.000 m2
- General goods warehouse with 3 cells with an area of 975 m2 and a height of 7.5 m
- General goods warehouse with an area of 375 m2 and a height of 8,65 m.

Braila Port has a Security System facility implemented (ISPS Code), in accordance with national and international standards regarding security and protection of sea vessels and harbours (facilities) where they operate.

It is also equipped with a security guard service, video surveillance and necessary equipment for fire prevention and extinguishing.

4.17.8 Potential port users

The entire available land, all platforms, storage areas and warehouses located within Braila Port area are rented to private operators.

It is the responsibility of port operators and their commercial and business strategies to bring additional traffic flows in the port and/or to increase the existing traffic of goods.
Each year the port administration asked them to provide the traffic forecast or to update it (if exists) and establish with all port operators' companies the minimum traffic that have to be handled in the next year.

This activity is mentioned as mandatory in the renting contracts concluded with all port operators.

4.17.9 Planned industrial and economic developments in the port's hinterland

Braila County will become an important economic pillar at regional and national level by capitalizing on existing resources: geo-strategic positioning, agricultural land, natural and man-made heritage and human resources. The residents of Braila County will have varied and well-paid jobs and access to quality public infrastructure and services and a natural environment free of pollution.

Analysed in terms of demographic, economic, social, al characteristics of habitation or anthropic heritage, Braila County presents a series of imbalances that I can't be neglected. Currently, Braila City focuses excessive population, economy, culture, premises the future development of the county. However, neither the situation of the county residence is not good, its current level of development being far from the status of which is generally referenced locally.

The development of Braila County will not be dissociated from its resources. It is precisely these resources that must be the engine of development, as natural as it is capable of generating wealth on the widest scale and in a long time horizon. In the medium and long term, Braila County will have to devote its development resources to certain economic and cultural directions for which there are resources and premises at local level. This approach will be based on the principles of resource efficiency and specialization and will have to have the capacity to lead to development but also to reduce the problems faced by the county.

The most important natural resource available to the county is the agricultural land. In support of this statement are the important agricultural land areas available to the county, the special pedological qualities of the soil, the traditional character of agriculture as a basic occupation in the rural communities of the county, the important share of the employed population in agriculture. The future development of agriculture will take into account all these characteristics but will pursue an integrated approach both horizontally and vertically. The development efforts that will be supported by both the public and private environments of the county will have to take into account the importance of agriculture as an economic activity, as a status and as an identifying feature. Agriculture will have to become a profitable business, and local products will have to bring significant added value to communities. The solution is to connect agriculture to industrial branches and specialized services so as to build producer networks - Processors - traders pursuing a common goal: local development. Implementation of this desideratum means numerous and well-paid jobs, lifting the risk of poverty of subsistence farmers, reducing the social problems faced by the county, increasing local development budgets. Last but not least, we can build a solid cultural identity of a community with a history worth remembering and having as a landmark.

Local businesses will have to be supported and other new ones will have to be encouraged to fuel the future functioning of the county economy.

The prerequisites for economic development, namely those that depend on the local level, will have to be ensured: local transport infrastructure, support infrastructure of the factions, dynamism of the associations and cooperation in the economic field, with a special emphasis on agriculture.

Associative structures in agriculture that have proved to be the successful solution in many developed economies must be supported above the prejudices and mentality existing at the level of agricultural producers. Support will also be given to downstream collaboration around a potentially dynamic economic activity.

Specifically, the development of clusters and / or economic associations in areas such as agriculture, shipbuilding, light industry, tourism, etc. will be supported.

Although it has been a matter of debate for decades, the establishment of the urban system Braila-Galati will have to be carried out during this period.

It is a particularly important moment for this because of the existing opportunities in terms of supporting local investments, the inevitable transformations that the country will pass from an administrative point of view, but also due to the factual state of the entire area concerned: the individualistic development of two Communities that are almost territorial in common, with common problems and even similar aspirations, are more difficult to deal with when discussing socio-economic development issues, infrastructure, etc.

Beneficial effects are easily identifiable as this structure would create the most important national development pole after Bucharest, given the location on the eastern border of the European Union and, above all, its location along the Danube.

The advantage and the attribute of being a Danubian county has not been sufficiently exploited in the last decades, neither economically, nor urbanistically or culturally.

In the next period, the development of port infrastructure will have to become a priority for the development of the county.
The port will have to become one of the county's weight centres, integrating the transport activities with the tourist and leisure activities.

The development of fishing as a commercial activity will have to take into account the fishery resources available to the river and will have to deal with related activities such as tourism and recreation.

Fisheries traditions, as long as they exist and can still be saved, will have to be integrated into fisheries activities, including in order to create added value for local products.

Fishing will be promoted as a traditional occupation of local communities on the Danube and will have to be capitalized in terms of tourism and culture.

The human resource will be the centre of the future development of Braila County. Population is the very reason of development, but also the first element of the gear that must be moved to generate development.

The human resource will therefore be treated as a special priority of the county but also as an essential vector of development.

The county will have to provide high quality education services that address both the vocational training of individuals and their integration into a society based on sound and sustainable socio-cultural elements.

The population's health will also have to be a priority, and the qualitative and territorial development of the healthcare delivery system will be supported.

The social sphere is also a priority issue when we discuss providing a framework conducive to the development of the county. Institutions and organizations active in the social field will be supported in the development of specialized services while at the same time reducing the risk of social problems.

The intersection between sanitary and social services must be seen both in terms of prevention and of joint intervention as close as possible to people in need.

A problem that the two sectors will have to deal with in common is demographic aging, a phenomenon that cannot be stopped for a considerable period of time and to which attention must be paid.

4.17.10 Cargo statistics

The main goods handled in Braila port are mineral products, cereals, wood products and fertilizers.

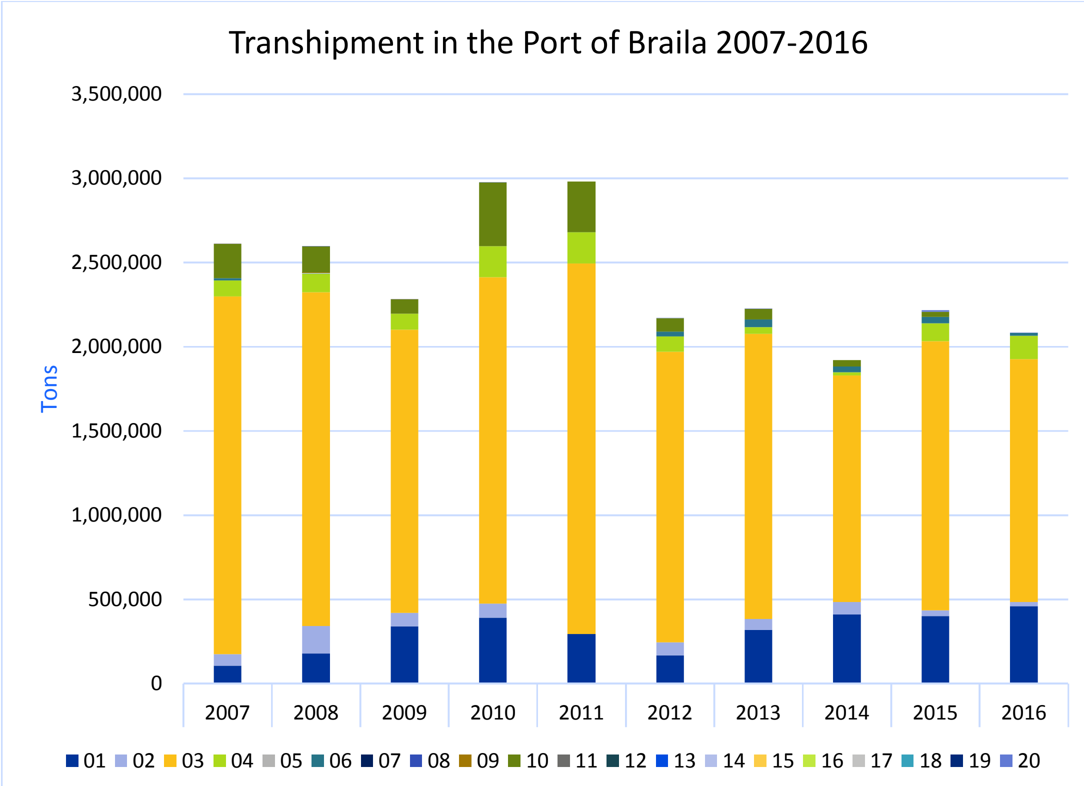

Figure 58: Transshipment in the Port of Braila 2007-2016

(Source: iC consulenten, based on data provided by APDM)

4.18 Port of Tulcea

4.18.1 Position

Port of Tulcea is one of the largest and most important Romanian river ports. Located in Tulcea city on the right bank of the Danube, the km 70,0 and km 73,5 including the Industrial and Commercial sectors.

<u>Position:</u> Lat. 45° 10' N   Long. 028° 49' E

Figure 59: Port of Tulcea

(Source: APDM)

After having crossed 2.860 km, the Danube passes through Tulcea from where it sends diverges into 3 branches Chilia, Sulina and Sfantu Gheorghe on its way to the Black Sea. Tulcea is viewed as a gateway to the Danube.

Tulcea county, covers an area of 198 km, located 125 km away from Constanta, 267 km away from Bucharest (by road) and 71,3 km away from the Black Sea (by waterway).

Tulcea is an industrial city, a modern port for passenger vessels, industrial products and oceanic fishing vessels.

The Danube river (Tulcea stretch NM 38+500 m) belongs to the 2nd quality class, excluding the oxygen regime which belongs to the 3rd class. In 2006 the most excesses have been registered in relation to organic substances, chlorides, nitrites, ammoniacal nitrogen, phenols. The river is affected by the discharges belonging to SC Alum SA Tulcea, the vessels and the domestic waste water discharges.

Taking into the account the path covered by the Danube until it reaches Tulcea county, the discharges made along the way as well as the dilution percent of the Danube, it can't be precisely established the degree to which the economic agents in Tulcea county contribute to the overall quantities of water pollutants.

The following ports are operational in Tulcea county: the industrial port, the mineral port, the passenger port and the commercial port. Through this last port the cargo flow for ferrous concentrates, bauxite, fish is ensured by vessels and barges of up to 18.000 tdw.

There are regular vessels providing the passenger transport on all the branches of the Danube: Chilia, Sf. Gheorghe, Sulina. The main ports in Tulcea county are: IAMC port, the industrial port, the commercial port and the passenger port. Tulcea port coordinates the river transport and the economic activity in the Danube Delta region.

Tulcea port is a maritime and river port, the third largest after the Port of Galati and Braila. It is located on the right bank of the Danube, between NM. 37 and NM. 42, right in the neighborhood of Tulcea city.

The main parts/terminals of the port are:

1. The Industrial Port/Terminal – Located on the right bank of the Danube in the area of NM. 39+1400; it deals with the unloading operations of raw materials (bauxite, chrome and ferromanganese ore, coke and quarry and ballast products).

Figure 60: Tulcea Industrial terminal

(Source: APDM)

2. The Commercial Port/Terminal – Located around NM. 38,9 is used for the traffic of goods destined to the supply of the commercial companies in Tulcea county and of those in the Delta area.

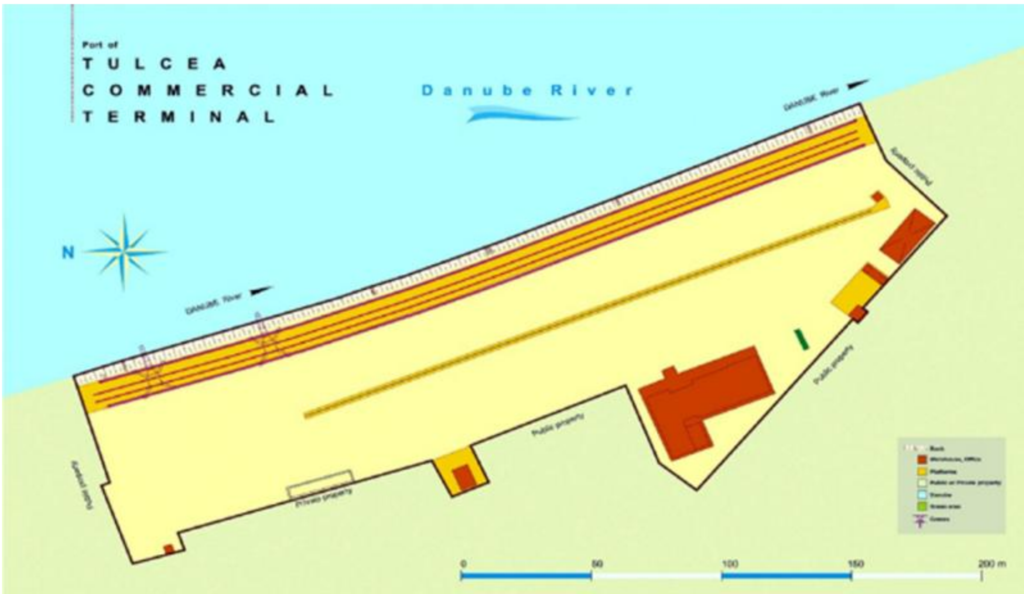

Figure 61: Tulcea Commercial terminal

(Source: APDM)

<u>3. The waterfront area</u> – Located between NM. 39 and NM. 38 + 800, is used for the mooring of pleasure boats and passenger ships.

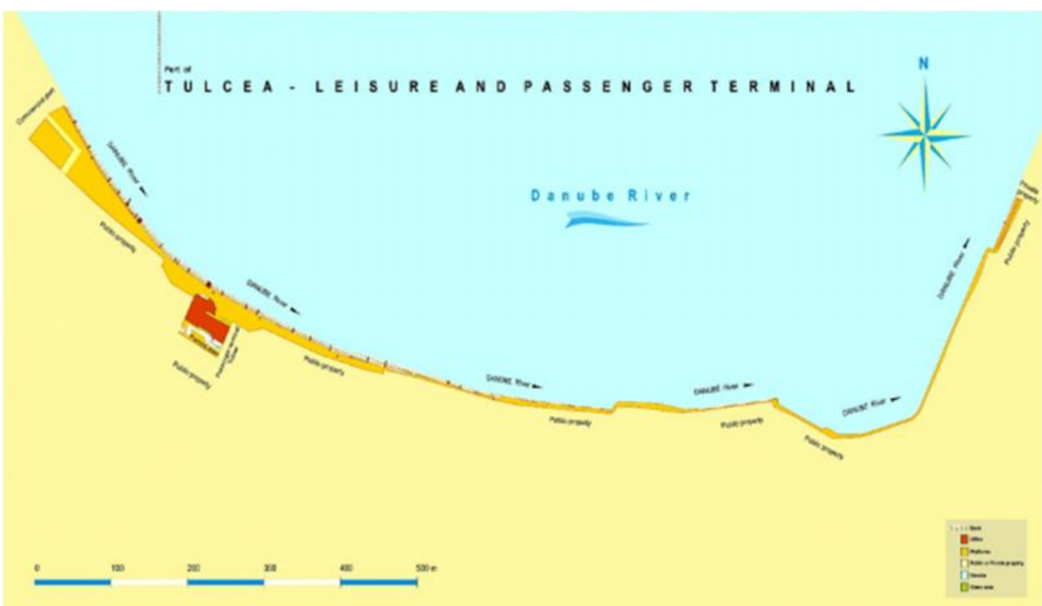

Figure 62: Leisure and Passenger terminal of the Port of Tulcea

(Source: APDM)

<u>4. The Ballast Berth</u> – Located on the right bank, at Nm. 38.

4.18.2 Ownership, administration (governance) and operation

Land and infrastructure are owned by the Romanian state. The governance and the administrative obligations are made by the National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati).

The National Company – Maritime Danube Ports Administration LSCo. Galati (CN APDM SA Galati) fulfils the function of Port Authority and the quality of Port Administrator in the sea – river ports located on the Romanian river-sea stretch of the Danube.

4.18.3 Infrastructure assessment

- Total area: 82.762 square meters
- Quay length: vertical = 330 m, sloped = 2.225 m
- Number of berths: 41
- Rail connection: length = 320 m (European gauge)
- Connection to the national highways
- Passenger Terminal
- Cargo storing facilities (open storing areas)
- Port equipment for vessel operation
- Ship-waste collection facilities: domestic waste (garbage, separated waste: paper, glass, plastic, metal), domestic waste water (grey and black water), oily and greasy ship waste (sludge, oil filters, used batteries, oily rags, contaminated metal packaging materials)
- Cereal silos
- Customs office
- "AKER" Shipyard
- Ship maintenance facilities
- Cleaning the storing facilities
- Passenger transport facilities to/from the Danube Delta.

Tulcea port has vertical quay length of 330 meters and a length of 2225 meters sloped quay. The port has a Ro-Ro river terminal on Tulcea - Reni and return route.

The **Industrial Port/Terminal** of Tulcea is located at km 73.5 on the Danube, built since 1974 in order to provide the necessary raw materials needed for the metallurgical platform in Tulcea. The main activities of the industrial port are:

- unloading imported raw materials such as manganese, lime, quartzite, bauxite, chrome, iron and coke from seagoing vessels;
- unloading of quarry ballast products from barges;
- loading of exported raw materials as iron, scrap and alumina.

The **Commercial Port/Terminal** of Tulcea serves for passenger traffic in entire Danube Delta area.

Maritime Berths

- 2 maritime quays for receiving and expedition of ferroalloy and concrete gantry transports
- An operating length of 230 m
- Endowed with portal cranes (KANGUR type - 16 tf x 32 m) equipped with grippers
- Cranes opening: 15.30 m
- Storage capacity: platform - 8.000 sqm

River Berths

- 1 river quay for receiving ferroalloys and concrete gantry transports
- An operating length of 100 m
- Endowed with portal cranes (KANGUR type - 16 tf x 32 m) equipped with grippers
- Cranes opening: 15.30 m
- Storage capacity: platform - 3.000 sqm

Commercial Port/Terminal of Tulcea comprises two sectors:

- Down the Oceanic Fishing Port – berths specialized for general goods and passengers traffic
- At km 70,0 – berths specialized for ballast products

Table 13: Characteristics of berths in the Port of Tulcea

Berth	**Length (m.)**	**Depth (m.)**
Industrial Port:		
River Berth	110	3.5
Maritime Berth	230	7.5
IPO Port	285	
Commercial Port	310	3.5

(Source: APDM)

Table 14: Capacities in the Port of Tulcea

Cargo	**Operation**	**Vessel Capacity (Tons×1000 per Ship per Day)**					
		Up to 600	**601-1500**	**1501-3500**	**3501-6000**	**6001-15000**	**Over 15000**
Ore	Field	1.00	1.50	2.00	3.00	5.00	7.00
	Vehicle	0.80	1.10	1.50	2.00	3.00	4.00

Cargo	Operation	Vessel Capacity (Tons×1000 per Ship per Day)					
		Up to 600	601-1500	1501-3500	3501-6000	6001-15000	Over 15000
Coke	Field	0.70	1.00	1.30	1.80	2.60	3.60
	Vehicle	0.60	0.90	1.20	1.50	2.00	2.60
Miscellaneous		0.30	0.40	0.50	0.70	0.90	1.00

(Source: APDM)

4.18.4 Special infrastructure regarding surface pavement & drainage of rain water

No information available due to the fact that this topic it's not the responsibility of the port administration. Drainage of rain water systems are part of the construction systems for each port platform and all these platforms are owned by the private port operators.

Port operators are responsible to keep them functional and also it's their responsibility to conclude the contract with local water company for collecting the rain water.

4.18.5 Hinterland connections (road, rail and IWW)

The city of Tulcea is located in the Danube Delta and is a connecting hub between isolated islands in the delta and the land transport network. The Tulcea valley area allows both the chartering of vessels carrying passengers and goods of strict necessity in the delta and cruise ships as an important port for passenger traffic.

They have connection to Railway length = 320 m, Wide track gauge - along operating docks and road - connection to the national road system. The distance to highway is 100 Km.

4.18.6 Hinterland (economic situation in the port's hinterland)

In Tulcea, industrial activities are carried out on two platforms; East and west. Currently, the industrial units that absorb most of the labour force in the city are:

- type of non-ferrous industry, located in the west,
- type of naval industry, located in the west,
- type of metallurgical industry, located in the west.

The economic activities of Tulcea are represented mainly by industry metallurgical, shipbuilding, construction materials processing, woodworking, light industry - garments and leather, food industry - fish, meat, dairy, wine, vegetables, fruit.

The economic activities of the municipality register a relative consolidation by taking over some large enterprises by foreign investors.

There is also a consolidation of the textile industry, many of which work exclusively for export. The economic activity of Tulcea is represented mainly by industry metallurgical, construction, shipbuilding, materials processing industry, construction industry, wood processing industry, textile industry (clothing and leather), food industry (fish, meat, dairy, wine, vegetables, fruits).

In the local economy, agriculture has a small share. On the other hand, the fisheries and fish processing industries have an important role because of the special features of the area and the geographical position.

4.18.7 Major port users

SC Deltanav SA – Port Operations Division operates a total of 3 ports/terminals in Tulcea County:

1. Tulcea Industrial Port/Terminal (PIT)

Through the Tulcea Industrial Port, Deltanav offers loading and unloading services for a variety of raw materials such as manganese, bauxite, iron, limestone, quartz and ferroalloys. We mention that our facilities in Tulcea Industrial Harbour can accommodate both river and sea vessels.

2. Tulcea Commercial Port/Terminal (PCT)

Through Tulcea Commercial Port, Deltanav offers loading and unloading services for a variety of raw materials such as sand, grain, timber and ballast products.

3. Mahmudia Port (PM)

Through Mahmudia Harbour, Deltanav offers bulk limestone loading and unloading services. The existing facilities in Mahmudia Harbour can accommodate river vessels.

4.18.8 Potential port users

The entire available land, all platforms, storage areas and warehouses located within Tulcea Port area are rented to private operators.

It is the responsibility of port operators and their commercial and business strategies to bring additional traffic flows in the port and/or to increase the existing traffic of goods.
Each year the port administration asked them to provide the traffic forecast or to update it (if exists) and establish with all port operators' companies the minimum traffic that have to be handled in the next year.

This activity is mentioned as mandatory in the renting contracts concluded with all port operators.

4.18.9 Planned industrial and economic developments in the port's hinterland

Improvement of existing passenger ship passenger services on Tulcea – isolated areas of the Danube Delta, rehabilitation of small local ports together with improving mooring facilities and port services. Additional ship passenger services would improve the connectivity of the Danube Delta with Tulcea. The effect of this would be to reduce living costs for people living in the Danube Delta area and to increase the use of Tulcea port.

Ties with Braila and Galati will help achieve the regional development objective and will offer some cluster benefits to Tulcea and Sulina. In addition, the Danube Delta is a tourist attraction due to its unique biodiversity and the ferry will be an ecological way to carry the number more tourists in the area.

By developing the 3 berths for the direct loading of bulk cargo ships such as grain, economic and social benefits will be recorded.

This would entail the construction of adequate facilities for the operation of the goods and dredging to ensure the necessary depth. Road and rail links with the port will also have to be improved.

4.18.10 Cargo statistics

Tulcea Port is a gateway to the Danube Delta. In the harbour there are passenger ships, but also commercial vessels serving the local industry. The port mainly operates mineral products (broken stone and grit, gypsum, slag, salt) and is mainly involved in supplying material to the construction sector.

The main activities are the loading and unloading of various raw materials such as manganese, bauxite, iron ore, limestone, ferroalloys from sea and river vessels.

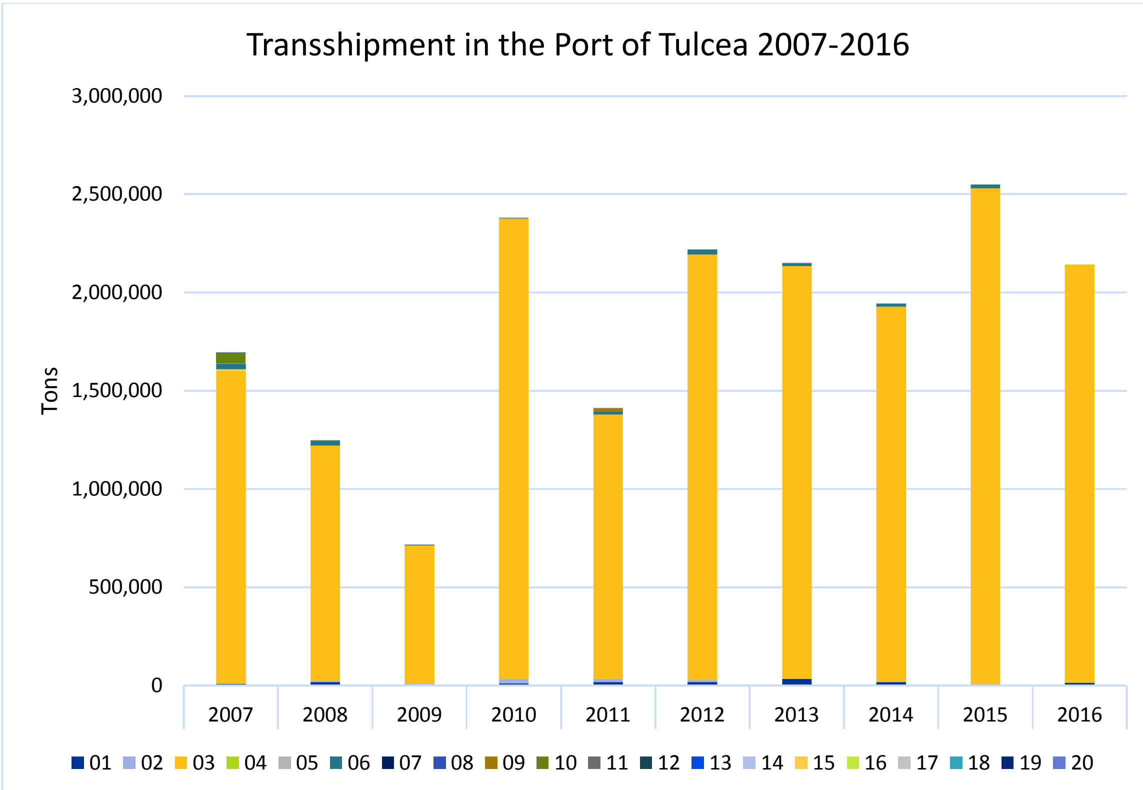

Figure 63: Transshipment in the Port of Tulcea 2007-2016

(Source: iC consulenten, based on data provided by APDM)

4.19 Port of Constanta

4.19.1 Position

The Port of Constanta is located in Constanta, Romania, on the Western coast of the Black Sea, at 179 nautical miles from the Bosphorus Strait. The geographic coordinates for indicating the position of Port of Constanta are Latitude: 44° 7' 51" N and Longitude: 28° 39' 43" E (Gara Maritima Constanta).

The connection of the port with the Danube river is made through the Danube-Black Sea Canal, ending the Rhine-Danube Corridor, which provides the main east-west link across Continental Europe. Its route along the Danube River connects Strasbourg and Southern Germany with the Central European cities of Vienna, Bratislava and Budapest, before passing through Serbian, Bulgarian and Romanian ports.

Figure 64: Port of Constanta on the Danube – Black Sea Canal

(Source: www.portofconstantza.com)

4.19.2 Ownership, administration (governance) and operation

The Port of Constanta land is owned by the Romanian State and was granted through a concession contract to the port administration N.C. "Maritime Ports Administration" J.S.Co. Constanta, which is a joint stock company (80% Ministry of Transport, 20% Proprietatea Fund).

NC "Maritime Ports Administration" SA Constanta is a state-owned company and has the role of port authority for the Port of Constanta and its satellite ports - Midia, Mangalia and the Tomis Marina.

Based on the administration model – landlord port, the port infrastructure is leased to private operators. According to the Law 108/2010, the governing contract type concluded between NC "Maritime Ports Administration" SA Constanta and the operators for terminals and adjacent areas is the lease contracts. The port assets are leased out or sub-concessioned to private port operators.

4.19.3 Infrastructure assessment

The Port of Constanta covers 3.926 ha of which 1,313 ha is land area and the rest of 2.613 ha is water area. The total land area of 1.313 ha is shared between the North Port that occupies a land area of about 495 ha and the South Port with about 818 ha. Another 561 ha are included, according to the masterplan, in development project for short, medium and long term perspective.

The Port of Constanta is not an open shore port. Its infrastructure is basin type with two basins. The main tuning basin for the North Port of Constanta is located in front of the oil terminal having enough area to enable the manoeuvring of the common vessels calling the North Port. The first is located at the port entrance, after passing the South breakwater, while the second is located at the exit from the port, in front of the basin between piers 1S and 2S. The standard berthing manoeuvrings require tug assistance and present a significant challenge, especially for berthing container vessels at the Constanta South Port terminal in which the navigation is limited to one-way traffic.

The Constanta Port has the maximum draught, natural or dredged, of 19 m and a minimum water depth of 7 m.

The maximum draught natural or dredged is 17,5 m. The historical part of Constanta Port the so called Old Port, located in the most northern port area has a limited water depth of 8,25 m. The cargo handling capacity is about 120 million tons per year including liquid bulk, dry bulk, containers, Ro-Ro and general cargo.

Figure 65: Port of Constanta

(Source: www.constantza-port.ro)

The Port of Constanta is a container hub and is the most important container terminal in the Black Sea with a throughput capacity of 1,5 million TEU/year.

Port service time is 56 hours per week. Considering the average number of non-operational days due to adverse weather conditions such as: rain, fog and heavy storm the number of weather working days (WWD) varies between 330 and 350 per year.

The Port of Constanta area is utilized through a total number of 21 terminals for commercial cargo handling operations.

The port has ten terminals for bulk cargoes. The dry bulk cargoes (iron and non-ferrous ore, grain, coal, coke, cement, construction materials, phosphate etc.), are operated in specialized terminals located next to the river-maritime basin. There are specialized terminals that operate iron ore, bauxite, coal and coke have 13 berths. There is specialized terminal where fertilizers, phosphate, urea, apatite and other chemical products are operated.

The Port of Constanta is a traditional partner for the Eastern and Central European countries with high agricultural production that transit their cargoes towards worldwide destinations. There are many facilities for the operation and storage of dry cereals, which are served by several specialized berths.

The break-bulk (general) cargo are operated by eight terminals. All range of services for general cargo are efficiently provided by stevedoring companies. There can be handled food, beverages and tobacco, paper and cardboard, cellulose, rolled metals, machine parts, bagged cement and other break bulk cargo.

The Port of Constanta has four terminals for oil/chemical/gas. The main liquid bulk cargoes are represented by crude oil and oil products. The Port of Constanta has a specialised terminal for the import of crude oil and other oil products and for the export of refined oil products, oil derivatives and other liquid chemical products. The oil terminal is equipped with a modern and efficient fire and pollution fighting facilities.

The Port of Constanta has two Ro-Ro terminals equipped with two ramps to handle any type of vehicle and Ro-Ro cargo: the car terminal and the Ro-Ro Ferry terminal. There is not a fully dedicated terminal for cars and currently, the main car operator splits its activity in two berths. The Ferry-Boat terminal offers exceptional facilities for the freight loaded in wagons, containers, and trucks and transported by ferry vessels and liner services on the Black Sea. There is suitable equipment for loading and unloading trains using the normal European railway standard. The terminal has five rail tracks for vessel boarding and the wagons are operated using ship's gear. For the time being, no regular Ro-Ro Ferry line is established.
Every quay-side container terminal that operates in the Port of Constanta has rail access.

The port of Constanta has no bi-modal terminals separated for rail-road within the port area. The port is an important node in integrated logistics chains, offering through the five tri-modal terminal quick and safe access to port facilities from an inland transport system including inland water, railway system and road access. Currently there are a limited number of containers moving inland by water freight.

There are eight multipurpose terminals that can accommodate vessels.

For oversized and over weighted cargoes in the Port of Constanta, private companies provide heavy lift cranes that facilitate the handling of heavy lift and out-of-gauge loads.

The railway infrastructure facilitates handling full block train in the port area as well as along the quay. Therefore, through the round-the-clock train services and every day shuttle trains high volumes of cargo are transported to/from the most important economic areas of Romania and Eastern Europe.

Figure 66: Rail network in the Port of Constanta

(Source: www.constantza-port.ro)

Private companies specialized in cargo transhipment are operating in the Port of Constanta. Using specialized equipment for intermodal transport they provide direct transhipment services for bulk and packed/unitized cargo: Sea vessels – barges, Barges – sea vessels, Wagons – barges and/or small sea vessels, Small sea vessels/barges – wagons.

Liquid bulk can also be transhipped into river vessels to various European destinations or carried through pipelines within the domestic hinterland. Pipelines network connects the port with the main refineries in the country thus securing fast transportation.

The total length of quay in the port of Constanta amounts to 29.830 m and is exclusively vertical. There is no sloped quay. A length of 3.262 m of quay is undeveloped.

The maximum number of vessels that can be handled at the same time in the Port of Constanta is 96.

The river-maritime area in the Port of Constanta has recently implemented a waiting area for barges, either self-propelled or not. The facilities have the main purpose of providing temporary mooring quays for incoming and outgoing barges and pushers without interfering in transit coming from the Danube-Black Sea channel and other cargo handling operations. Considering a mooring scheme with 1 to 2 barges perpendicular to the quay, a barge width of 11.40 m and a safety distance of some 1 to 2 m between the barges the existing terminal allow for safe mooring of some 150 to 200 barges.

The water depth at the Barge terminal is 7 m, the total quay length is some 1.200 m and the available water area is some 350.000 m2.

The port has facilities for mooring/anchorage for dangerous cargo vessels.

According to the European Conference of Ministers of Transport classification, the size of the vessel/convoy transiting the waterway connection Danube – Black Sea canal is inland waterway class VIc,

The Port of Constanta is very well connected with the national and European road network through ten road entrances allowing systemization and organization of traffic through 25 road lanes. The total length of roads in the port amounts to 100 km. The A2 motorway, nicknamed The Sun's Motorway, is linking Bucharest to city port Constanta and a length of 203 km.

The railway infrastructure comprises of six rail gates and nine rail tracks providing the connection between Europe, Caucasus and Central Asia. The total length of rail tracks along the quay walls is 19,873.63 m and the total length of rail tracks within the port area amounts to 300,000 m.

The area of port platforms sum up 3,898,325 m^2 providing a large storage capacity. Within the oil terminal a volume of 1,700,000 m^3 can be stored.

Container terminals have more than double operational capacity comparative with actual traffic (711,339 TEU in 2016), having a storage capacity of 16,000 TEU. The development plans for these terminals are very important.

The two terminals operating the Ro-Ro have a storage capacity of 6,600 CEU.

The Port of Constanta provides various bunkering facilities within the port area. Private companies offer bunkering services for vessels by tank, terminal and auto from tank trucks.
In order to be in line with the EU Commission strategy regarding the future use of clean fuel for IWT, and to cover the potential demand of the LNG as a clean and economical fuel a LNG bunkering station is planned to be constructed in the river-maritime area of the Port of Constanta.

The port of ensure a sufficient and continuous provision of power through its shore-side power supply facilities for vessels.

Waste management in the Port of Constanta represents an important component that comply with the national and international legislation on environment protection by creating an efficient working framework for collecting, treating, stocking and storing of port and marine wastes. There are four components: the incinerator, the ecological site, the collecting-ship, the wastewater treatment plant & leachate treatment station.

To support the environmental pollution control of vessels the port offers facilities for the collection and reception of the used oil.

4.19.4 Special infrastructure regarding surface pavement & drainage of rain water

Sewage water is collected in several port areas (New Port, Old Port, River Port and South Port) through free-flow pipes and is transported by pressure pipes to the local treatment plant located at Mole V in new port. There are 5 mini-treatment plants that have been installed in areas where there is no sewerage network connected to the main treatment plant.

The treatment plant is operating with two treatment steps. The first is mechanical and the second biological. The mechanical treatment stage (storage tanks, pumping station, oil separators) takes place inside the Oil Terminal, east of the existing separators, near the 69 on Mole V. Buildings and capacities associated with the biological treatment stage are located south of the Oil Terminal, on a territory located behind the Danube 79 (the oil-bearing station) and the west.

The treatment plant has a capacity of 814.000 m^3 / year or from a normal 46 m^3 / h to a maximum of 93 m^3 / h. The treatment for wastewater consists of five steps:

- Step 1: Storage and homogenization of waste water
- Step 2: Removing light products (low density)

- Step 3: Biological treatment
- Step 4: Filtration
- Step 5: Treatment of sludge.

4.19.5 Hinterland connections (road, rail and IWW)

The Port of Constanta is located at the crossroads of the trade routes linking the markets of the landlocked European countries to Transcaucasus, Central Asia and the Far East. The port has connections with the Central and Eastern European countries through the Corridor IV (rail and road), Corridor VII - Danube (inland waterway), to which it is linked by the Danube-Black Sea Canal, and Corridor IX (road), which passes through Bucharest.

Rail Infrastructure. The rail network in the Port of Constanța is connected to the Romanian and European rail network, with the Port of Constanța being a starting and terminus point for Corridor IV, a Pan-European corridor. The corridor IV follows the route: Dresden / Nuremberg – Prague – Vienna – Bratislava – Győr – Budapest – Arad – Bucharest – **Constanța** / Craiova – Sofia – Pernik - Thessaloniki or Plovdiv – Istanbul.

Constanta Port North has a complex railway system, which has been designed to bear the largest part of the port cargo; only a small percentage was foreseen for road transportation. In this area of the port, the railway traffic has decreased since the 1990's and many operators preferring road transportation by trucks.

In the Port of Constanta South, the railway network hasn't been finished. Nevertheless, from the feasibility studies made for the south side of the port, it is to be seen that railway traffic is increasing. Because of this, MPAC is undertaking extension and modernization works for the lines in the south side of Constanta Port, where the majority of the lines are under the administration ownership of MPAC.

The total length of railways in the port amounts to 300 km.

Corridor VII – Danube. The Port of Constanta is linked with the hinterland by the Danube – Black Sea canal. The entrance to the channel is on the South part of the Port and connects the Black Sea with the European inland waterway network. The canal offers an alternative route from the Black Sea ports to the Danube ports of Central Europe that is shorter by approximately 400 km.

The canal branch has a length of 64.4 km and connects the river Danube with the Port of Constanta. The southern branch, which is also the main one, runs from Cernavodă, on the Danube (km 300), to Constanta. The major opportunity offered by the Danube is made up of dry and liquid bulk cargo transport between land-locked countries on the Danube, namely Serbia, Hungary, Slovakia, Bulgaria, Austria and the Black Sea.

Road Infrastructure. The Port of Constanta port is also located close to Corridor IX, passing through Bucharest. The corridor IX follows the route: Helsinki - Vyborg - Saint Petersburg - Moscow - Kiev - Chișinău - Bucharest - Ruse - Dimitrovgrad - Alexandroupolis.

The access to the port and the internal road network were designed before 1989 and were linked to the city road network, on which heavy traffic was allowed. The total length of roads in the port amounts to 100 km. The highway A2 connects Port of Constanta with national road network.

4.19.6 Hinterland (economic situation in the port's hinterland)

The hinterland of Constanta Port supports the port regarding the produced, consumed and forwarded goods to/from the port. During the last decade, the Port of Constanta efficiently served the flows of goods that arrive or depart from/to the Central and Eastern Europe, including: Austria, Czech Republic, Slovakia, Hungary, Serbia, Bulgaria, Moldova and Ukraine. The Port of Constanta handled 59.424.821 million tonnes in 2016 and had 14.516 vessel movements of which 30% (4.331) were maritime-related and 70% on to the river network (10.185).
In the last four years the total throughput increased every year and this allow us to consider that the Port of Constanta is on its true course, meaning a steady annual increase.

The year 2016 also meant the strengthening of the hub position for the transit of cargo coming from the landlocked countries of Central and South Eastern Europe and Constanta played this role by achieving a traffic of grains of 20.393.803 tonnes, thus becoming the leader of the Black Sea agri-bulk market.

Although many political and economic changes have taken place in this area and have influenced its evolvement significantly, the traditional transport routes using the Port of Constanta have remained unchanged, due to the competitive advantages of the port. The economic growth recorded during the last years in the Central and Eastern Europe countries entitles Port of Constanta to act as the main depositing and distributing centre for this region. Romania has a population of 19,8 million (2015), and generated a GDP of 21.647,81 US dollars in 2016. The real GDP growth was 3,9 in 2015 and 4,8 in 2016. The International Monetary Fund (IMF) has projected for the Romanian economy growth to reach 4,2% in 2017, and to 3,4% for 2018.

A decision of the Romanian Government was issued in December 2013 on the commitment of 2% of GDP for the transport sector. There is a significant increase from historic average of 1,15% for 2007-2013. This is due to the assumed real increase in GDP. As per the General Transport Master Plan, between 2014-2030, the committed expenditures for maintenance and treatment of rehabilitation backlog amount to more than 50% of the total available budget.

4.19.7 Major port users

The beneficiaries of the Port of Constanta can be divided into three major groups. The first group of direct beneficiaries is represented by terminal operators who use the port infrastructure and receive direct benefit from new cargo being handled. The second group of Of port users are the ship operators and the third the related companies providing different connected services for cargo and ships.

There are also indirect beneficiaries represented by economic operators involved in international trade.

According to MPAC site there are 873 companies involved in providing services in Port of Constanta (including the satellite ports Midia and Mangalia), out of which 40 are port operators (37 acting in Constanta, and 3 in satellite ports).

Oil Terminal and Rompetrol Logistics Constanta Branch are the most important operators for crude oil and oil products. The Oil Terminal can operate tanks with capacities up to 165.000 dwt, being equipped with specialized facilities for loading and unloading and connected with the pipeline system. The other main operators of liquid bulk are Frial, Romned Port Operator, Sargeant Marine Romania, Transbitum.

The main operators for iron ores, bauxite, coal and coke are Comvex, Minmetal, Chimpex, Socep and TTS Operator 250.000 dwt vessels and above can be accommodated and river units are operated in direct or indirect transhipment.

Chemical Products and Fertilizers are operated by TTS Operator, Chimpex, Frial, Minmetal, North Star Shipping, Socep and United Shipping Agency. These are equipped with dedicated areas for operation and storage of chemical products and fertilizers, bulk phosphate and urea. Vessels up to 30.000 dwt can be accomodated and the total operation capacity of phosphates is 30.000 tons.

The most important stevedoring companies that operate agribulk in the Port of Constantza are TTS Operator, North Star Shipping, Minmetal, United Shipping Agency, Silotrans, Chimpex and Socep.

Important quantities of other dry bulk are operated in the Port of Constanta by the following port operators: Comvex, Chimpex, Decirom, Minmetal, Romned Port Operator, Socep and TTS Operator.
In Constantza Port there are four container terminals, which offer modern facilities and operating conditions for portcontainer vessels. The container terminals are operated by, Constantza South Container Terminal, Socep, APM Terminals Romania, Umex.

There are several companies operating general cargo. Perishable goods can be stored in adequate conditions in refrigerated warehouses and are usually handled by specialised stevedoring companies: Frial, Romned Port Operator, Chimpex, Decirom, Casa de Expeditii Phoenix and Socep. Important quantities of timber loaded in the Port of Constanta and dispatched over sea are handled by Decirom, Rotrac, Casa de Expeditii Phoenix, Socep and Umex. Specialised stevedoring companies that are efficiently providing handling operations for metallic products: Minmetal, Decirom, Romned Port Operator, Socep, TTS Operator and Umex.
The Ferry-Boat terminal is operated by SNTFM CFR MARFA and offers exceptional facilities for the freight loaded in wagons, containers, trucks and transported by ferry vessels and liner services on the Black Sea.

The Passenger Terminal is under the administration of the NC Romanian Ports Administration SA Constanta and has an operation capacity of 100.000 passengers/year.

Hereunder are presented the most important port operators:

Chimpex (owned by Ameropa) (*www.chimpex.ro*)

Chimpex is operating a total quay length of 2.26 km including 10 operational berths with water depth of up to 13.5 m. The operating area has 360,000 m^2 and total covered storage capacity is 300.000 tons, having a max. daily intake of aprox. 26.000 tons. There are 10 railway tracks and access for road transport.

Chimpex has finished recently a grain terminal in Constanta. The new state-of-the-art terminal has a storage capacity of 200,000 tonnes on 20 vertical cells, can receive cargo by barge (1 x 400 tonnes per hour), truck (2 x 400 tonnes per hour) and rail (1x 400 tonnes per hour) and has a vessel loading rate of 2 x 800 tonnes per hour. The investment was over 42 million EUR.

Comvex (*www.comvex.ro*)

Comvex has a quay consisting of 5 berths, with a total length of 1,400 m and a depth of water between 10,8 and 19 m. The unloading equipment consists of 3 cranes, each one having a discharge rate of 2,000 mt / hour.

The conveyor system has a total length of 22 km. Two of the main conveyor belts are 1,5 km long and a productivity of 4,000 mt / hour each, and the third one, inaugurated on August 2006, has a length of 2 km and a productivity of 4000 mt / hour.
From the unloading area the cargo can be conveyed through the conveyor belt system in the main depot to the barge loading equipment, to the trains, or it can be stored on the quay area. Comvex also has a specialized crane used for EACS type wagons. There is also a FALS wagon discharge system in operation.

The loading quay consists of 3 berths with a total length of 600 m and a depth of water between 6,6-7 m. There are three barge loading equipment with an average loading capacity of 2,000 mt / hour each, opening the arm allowing simultaneous loading of 2 barges of 3,000 tons capacity.

Comvex also has the possibility to load the goods in rail wagons via the railway terminal which has a loading capacity of 20,000 mt / day. The storage space extends over an area of approx. 600,000 square meters of which 155,996 square meters are located along the quay.

Comvex started the investment of approx. 52 million euros, excluding VAT, in a grain terminal with a capacity of 200,000 tons, in the berth no. 80, where the draught is 19 m.

Constanta South Container Terminal (owned by DP World) (*www.dpworld.ro*)

With an ultimate surface area of over 76 ha and 52 ha currently operational DP World Constanta provides a yearly vessel throughput capacity of approximately 1,200,000 TEU.
DP World Constanta operates over of a total quay length of 1020 m, with an excellent deep draught of 14.5 m, being able to accommodate and operate large capacity vessels. The main berth has 640 m length and the feeder berth has 380 m.

As the next phase for development at DP World Constanta, a further 1076 m of berth (berths 126-130) will be completed subject to demand.
DP World offers a 5,000 m^2 undercover storage and inspection facility for Customs, Government Authorities, brokers, and forwarders.

CFS services are able to be accommodated subject to requirements and transloading and unstuffing services are available.

Through its rail terminal, DP World Constanta provides a full rail coordination service. The rail terminal has 3 rail lines, each 600m long, capable of handling 3 complete 30 wagon trains at one time. These lines are operated with 2 x Rail Mounted Gantries with an adjacent stacking yard of 5,000 m^2.

In terms of IT the systems used are focused on delivering efficiency and helping customers effectively manage their supply chains. State of the art software and hardware is used to provide a full suite of messaging to EDIFACT standard. The terminal operating system is provided by Navis (Sparcs and Express). The customers have control of their container stock through web access service.

Decirom (*www.decirom.ro*)

Decirom uses 6 operational berths (23, 23/24, 47, 48, 49, 50) placed along the shoreline, both in the southern and northern Constanta Port, being served by 2 railway lines each. The total quay length is 1480 m and the water depth is 13,5 m. The equipment used by the port operator include: 17 quay cranes, 13 forklifts and 27 tractors with trailers.

The company is has following storage facilities in Constanta port:

- technological platforms: 30,000 square feet;
- storage platforms: 68,000 square feet;
- covered warehouses: 32,000 square feet.

Decirom is operating general cargo including wood products, steel bars and coils, sheet paper and packages, metal, food, chemicals, scrap, etc.

Minmetal, North Star Shipping (owned by ADM) (*www.adm.com*)

The services provided by the port operator include sea going vessels and river barges operation, stevedoring, storage, forwarding and inland transport.
Minmetal is specialist handler of bulk materials/product through three specialized port terminals:

- *Grain terminal*
    - storage capacity 260.000 tons (including meals storage facilities)
    - reception and delivery rate 30.000 tons/day
    - multimodal: road, rail, container, river and maritime dedicated operations
    - Panamax size vessels
- *Raw material terminal* (coal, cokes, iron ore)
    - efficient facilities to load / unload seagoing vessels, barges and railcars
    - two specialized open storage platforms with a total capacity 600.000 tons

- three platforms for bulk cargo storage totalling 113,500 m^2 and a storage capacity of 629,000 tonnes
- *Liquid Terminal* (fertilizers, vegetable oil, diesel biodiesel, gasoline)

Oil Terminal (*www.oil-terminal.com*)

Equipments and facilities:

- Petroleum terminal has 7 operational jetties
- Jetties allow berthage of vessels up to 165,000 dwt. capacity
- Connection between storage farms and jetties is done by a 15 km. underground and overground pipelines network
- Pipelines total length is 50 km.

Oil Terminal S.A. has three storage farms through which the following products are handled: crude oil, gasoline, gas oil, fuel oil, chemical and petrochemical products, oils from import or for export and transit.

Each storage is provided with the followings:

- storage farms with capacities of 1,500-50,000 C.M. of metallic construction, cylindrical, vertical, overground, provided with concrete safety belts, fixed and floating roofs and safety facilities;
- facilities for waste waters catching and cleaning;
- facilities for petroleum and liquid chemical products loading/discharging of 30 km. total length railplatforms, provided with remote loading equipments;
- transport pipelines of 100 and 1,000 mm.for loading/discharging into/from vessels of crude oil, petroleum, petrochemical, liquid chemical products and oils;
- pumps' control facilities located by jetties, for gasoline, gas oil' loading and crude oil' discharging;
- laboratories provided with physical, chemical analyses.

Socep (*www.socep.ro*)

Socep is part of the *DD Group*, which includes the following companies: *Casa de Expeditii Phoenix* – port operator, *Celco* – leading producer of AAC in Romania, *Hotel Condor* Mamaia, *Hotel Sulina* Neptun, *Logistik Park* – renting land for industrial purpose, *Socefin* – financial investment.
Socep is defined by two distinct terminal structures:

- Container Terminal – 300.000 TEU containers annual handling capacity

- General Cargo Terminal – 3 million tons of bulk and general cargo annual handling capacity

In addition to the two operational terminals, Socep also developed its operations in Constanta South Port, where we are able to perform stuffing/stripping operations.
Main operated cargo:

- Containers
- Dry bulk products
- Break bulk products

Socep is listed at BVB (Bucharest Stock Exchange) having a turnover about 15.000.000 Euros. The container terminal operates in two berths: D51 and D52, having a total length of 470 m and a platform summing 150.000 sqm. The warehouse is located at the base of the pier, receiving the cargo that is being transported in containers. The terminal has facilities to operate RO-RO vessels.

Socep offers a wide range of terminal services such as: storage and operating containers, storage and monitoring reefer containers, containers stuffing/stripping of any cargo type, CODECO Gate In / Gate Out reports, EDI capabilities and web access.
The general cargo terminal consists of six operational berths: D35, D36, D37, D41, D42 and D43, with a length of 210 meters each.

Loading / unloading vessels operations of general cargo: metallurgical products, bagged goods, timber products, paper, heavy lift projects, laminates are performed.

The dry bulk terminal has currently six operational berths: D35, D36, D37, D41, D42 and D43, with a length of 210 meters each. It provides services for dry bulk products, such as: cereals, fertilizers, bauxite, raw sugar, coke, sulphur, ores, lumber.

The main activities consist of storage and handling of bulk products through loading or unloading vessels, using a technological process composed of: quay cranes, transport trucks with trailers, unloading installation for dry bulk, ship loaders.

Umex (*www.umex.ro*)

In the Umex terminal are handled about 1.000.000 tons of various cargoes every year, mainly:

- Bulk cereals;
- Bulk and bagged fertilizers;
- Project cargo & heavy equipment;

- Metallurgical products;
- Bagged/palletised general cargo.

The Terminal is developed on an area of 140.000 m^2, including 120.000 m^2 of concrete open platforms and 20.000 m^2 of covered warehouses. For vessel operations there are 5 berths with 1020 meters total length, having the possibility to accommodate and operate 6 vessels simultaneously.

Umex has acquired in May 2016 one new Duplex type forklift with a loading capacity of 16 tons and maximum loading height of 5,47 meters. The acquisition was done in order to increase the capabilities in handling metal products.

The ship operators are important port users for the port of Constanta, the ship services providing 40% of port administration incomes in 2016. A total number of 14.516 ships called the Port of Constanta last year, out of which 10.185 were river calls.

The number of ships' calls was similar in the last five years. Ships calling Constanta are registered under various flags and they are represented by a number of 94 companies authorized to act as agents.

The structure of ships' type for maritime calls is almost the same (about 45% cargo vessels and about 15% for each of container ships, bulk carriers and tanks). Only the passenger ships registered a drop down from 95 calls in 2014 to only 17 in 2016 due to instability in the Black Sea.

The third category of port users included more than 1,000 companies providing different services to ships and cargo operated in the port. More than 800 companies are registered as providers of services as follows.

Services for ships: agents, repairs, supply, etc.
Services for cargo: loading/unloading, storage, stuffing/ unstuffing, lashing, mooring, packing, weighting, survey, freight forwarding, disinfection and deratization, etc.

4.19.8 Potential port users

Potential port users of the Port of Constanta are new port operators and the local businesses who might take advantages of the implementation of the development projects.

A major constraint for port users is the limited use of the fairway during low-water periods. According to the Danube Commission the minimum fairway parameters for the lower and middle Danube region are recommended as follows: depth of 2,50 m; width of 180 m and curve minimal curve radius of 1000 m. A gauging campaign in the Romanian river sections between 2006 and 2010 showed that at some of the bottlenecks the recommended water depth of 2,50 m was reached only 50 to 70 days per year with an absolute minimum of 1,60 m.

The estimation of total capacity of the Port of Constanta of 106.641.000 tons, and the throughput capacity in 2013, of 48.757.000 tons, shows that there is no acute shortage in capacity and the demand for further expansion is based on the results of the traffic forecast. On average, the utilization rate in 2013 was 43%. The maximum utilization rate was 58% registered for Containers and the minimum of 20% for Liquid bulk cargoes.

The cargo forecast is summarized in a baseline scenario included in the Master Plan of the Port of Constanta, which estimate a total increase from 55.136.696 tons in 2013 to 99.963.946 tons in 2040. The Dry Bulk traffic is expected to increase from 34.155.663 tons to 55.269.011 tons. For the liquid bulk there is an estimation to increase from 10.123.452 tons to14.528.449 tons in 2030, and to decrease to 11.680.570 tons in 2040. The traffic of general cargo is expected to gradually increase and double its capacity from 4.079.534 tons to 8.050.409 tons. For the Ro-Ro cargo, containers and passengers there are estimation of multiplying their existing throughput.

There are some investments already planned by potential future port users to be developed in the Port of Constanta. Hereunder there are presented those which more advances as planning.

Fuel terminal to be developed by Minmetal (ADM) at berths 64-64[16]

Based on the anticipated volumes through the terminal and the optimum use of the space available has been based on tanks of 32 m diameter and a maximum height of 20 m. The gasoline storage tanks will have internal floating decks, the tanks for diesel, biodiesel, fuel oil, vegetable oil and UAN liquid fertiliser will all be standard fixed roof tanks.

Gasoline

Gasoline will be received by rail into the storage facility and exported by ship. Phase 1 will include 2 gasoline storage tanks of nominally 12,000 m^3 capacity (32 m dia x 20m), with future expansion to 4 or 6 tanks total. The tanks will be fitted with internal floating decks. The largest gasoline ship to be loaded will be 35,000 t which will be carried out in less than 36 hrs, so will

[16] *Feasibility Study for Fuel Terminal in Constanta*, prepared by Stopford for Vadeco SRL, 2/05/2013

be loaded at a rate of 1000 te/hr (1400 m^3/hr). Main pipe from pumps to ship estimated at 14", with suction line 16" or 18" depending upon pump location.

Receipt from rail will be offloaded at a minimum rate of 360 te/hr (515 m3/hr). Main pipe from the pumps to the tanks estimated at 10". Local offloading line sizes will depend on detailed arrangements, but will probably consist of 4" offloading hoses from 6 rail cars to a 10" manifold to pump suction, with 6 offloading pumps/stations to cover a 36 railcar train. Pump size will be 250-300 m^3/hr so 2 stations will be connected and offloading at any time, with the 3rd being connected ready for change over once the first is finished.
Throughput is estimated at around 480,000 te per annum, which equates to 270 rail receipts and around 14 ship exports, depending on ship capacity.

Diesel
Diesel will be received by ship into the storage facility and exported by rail. Phase 1 will include 1 or 2 Diesel storage tanks of nominally 14k m^3 capacity with future expansion to 3 or 4 tanks total. The receipt from ship will be at a rate of approximately 1000 m^3/hr determined by ships pumps. A ship offloading arm will be provided.

Export by rail will be filled at a rate of 500-600 m^3/hr. There will be 6 loading stations each coupled to 6 railcars allowing connection to cover a full 36 railcar train. There will be 3 loading pumps each supplying 250-300 m^3/hr sufficient to fill 6 railcars at a station, with potential to fill 2 stations at a time running 2 pumps, with one spare. There will also be a small 2 bay road loading facility, each bay with 3 loading arms. Loading rates will be limited to 2,200 lt/min per arm, 132 m^3/hr each. There will be 2 loading pumps each of 400 m^3/hr and capable of supplying 3 arms, with no additional spare.

Biodiesel
Biodiesel will be received by ship (<13,000 te capacity) into the storage facility and exported by rail. Phase 1 will include 1 Biodiesel storage tank of nominally 14,000 m^3 capacity with no planned future expansion. Pumps and piping will be shared with the diesel system. The throughput of biodiesel is expected to be in the order of 60,000 te per annum.

LFO (HFO)
LFO will be received by rail into the storage facility and exported by ship. Phase 1 will include 1 or 2 LFO storage tanks of nominally 14k m3 capacity with future expansion to 3 or 4 tanks total. The receipt from rail will be at a rate of 500 m^3/hr. Export by ship will be filled at a rate of 1000 m^3/hr. Tanks and pipework will be insulated and heated by steam from an on-site package boiler.

The largest ship to be loaded will be 40,000 te, which will require 4 storage tanks. Throughput is set at around 360k te per annum, which equates to 200 rail receipts and around 12 ship exports, depending upon capacity.
Preliminary line sizes are as for gasoline as the rates are similar.

Vegetable oil
Vegetable oil will be received by ship (< 13000 te) into the storage facility and exported by rail. Phase 1 will include 1 tank of nominally 14k m^3 capacity with no future expansion planned. The receipts from ship will be at a rate of 1000 m^3/hr. Export by rail will be filled at a rate of 500 m^3/hr. Tanks will be insulated and heated by steam from a package boiler on site. The throughput of vegetable oil is expected to be in the order of 60,000 te per annum.
Preliminary pipe lines sizes are as per gasoline as the rates are similar.

Urea Ammonium Nitrate
UAN will be received by rail or barges into the storage facility and exported by ship. Phase 1 will include 4 UAN storage tanks of nominally 14K m^3 capacity, with future expansion possible to 6 tanks total. The tanks will be approximately 14k m^3 (18k te). The largest UAN ship to be loaded will be 48 k te, which will be carried out in less than 48 hrs, so will be loaded at a rate of 1300 te/hr (1000 m^3/hr). Receipt from rail will be offloaded at a rate of 650 te/hr (500 m^3/hr). Receipt from barge will be offloaded at a rate of 1300 te/hr (1000 m^3/hr). The throughput of UAN is expected to be in the order of 800,000 te per annum, which equates to around 450 rail deliveries or equivalent per annum and export of around 20 ships per annum.

Grain terminal at berth 80 (Comvex)[17]
The Grain Terminal will be located mainly behind the berth no. 80 in the Constanta South port. In this area will be located the storage and reception system from the trucks (laboratory, weighting machines and unloading vats) and the loading / unloading system in / from ships.

The surface will have a total of 63.600 sqm and the maximum height is given by the height of the bands above the cells which is 35,0 m.

The warehouse will have maximum theoretical storage capacity of 200,000 tons that consists of 18 cells of 10.000 t each and 8 cells of 2500 t each. The cells are arranged in two rows, 13 cells per row.

At the West end of the warehouse will be placed four vats for unloading the grain from the trucks and the "room engine ".

[17] *Grain Terminal at berth no.80 in Constantza South Port* - documentation for obtaining the environmental agreement, IPTANA SA, January 2015, *http://apmct.anpm.ro*

The cells will have cylindrical metallic constructions with a "cone" on the high side. The 10.000-ton cells will have a diameter of 27,5 m, a cylindrical height of 21,5 m and a total height of 29,0 m, and those having 2.500 t capacity will have a diameter of approx. 13,0 m and 29,0 m height.

The control of the temperature in the cereal cells is provided with temperature sensors.

The shiploaders will have a capacity of 1200 t / h. The loading area for the ships is a gravitational quay from reinforced concrete and has a foundation depth of 19.0 m.

The other known future investments are:

- Oil and oil products terminal on artifical island – X Tank SRL
- Multifunctional logistic base in Port of Midia – GSP Logistic SA
- New grain terminal – Socep SA
- New storage area for general cargo at berth 44 – Umex SA.

4.19.9 Planned industrial and economic developments in the port's hinterland

There is a plan for the development of the energetic sector through a new LNG terminal. The objective is to establish the position of Constanta Port as hub for the LNG import/transit in the Black Sea region and for the landlocked Danube countries, to decrease the dependency of the national energy supply on Russian natural gas monopoly and transit problems (Ukraine), to cover the LNG supply for the expected increase of LNG fuelled vessels and to boost the LNG fuel not only for shipping and transportation sector but also for other purposes as energy source for residential, commercial and industrial sectors.

The involvement of China in the energetic sector in Romania, by concluding in December 2016 the negotiations of the CEFC China Energy Company Limited with KazMunayGas to acquire 51% of KMG International NV, former Rompetrol will create benefits for all partners.

The assets and operations of KMGI in Europe and the Black Sea region will serve as a development platform and will target both the increase of KMGI's operational and financial performance and the expansion of the activities and operations of CEFC at the international level. Therefore, the strategic partnership will set the framework needed for the future joint projects, contributing to the economic and social growth in the regions where these projects will be implemented, most of them in Romania.

The development of transport infrastructure in the area proved to be a key factor in economic development. For instance, in the four years before the highway A2 was finished (2008-2012) the increase of GDP in Constanta county was 13%, less than the country average (14%) and in the next period (2012-2016) the evolution was more dynamic, the GDP increasing with 56%, while the country registered a nominal average increase of 29%.[18]

4.19.10 Cargo statistics

The majority of transported goods on the Danube are dry bulk cargos. For Romania the commodity split is as follows: ~40% cereals, ~25% iron ore, ~10% non-ferrous ores and scrap, ~10% coal and coke, ~5% fertilizer and 5% oil products.

According to the Annual reports[19] and data provided by NC Maritime Ports Administration J.S.Co. Constanta, the total volume of products of agriculture, hunting, and forestry (mainly cereals) traffic in the Port of Constanta has seen constant increase, with an extra increase the past 5 years. In 2016, the port handled approximately 20 million tons of grain with a growth of more than 400% compared to the 2007 year.

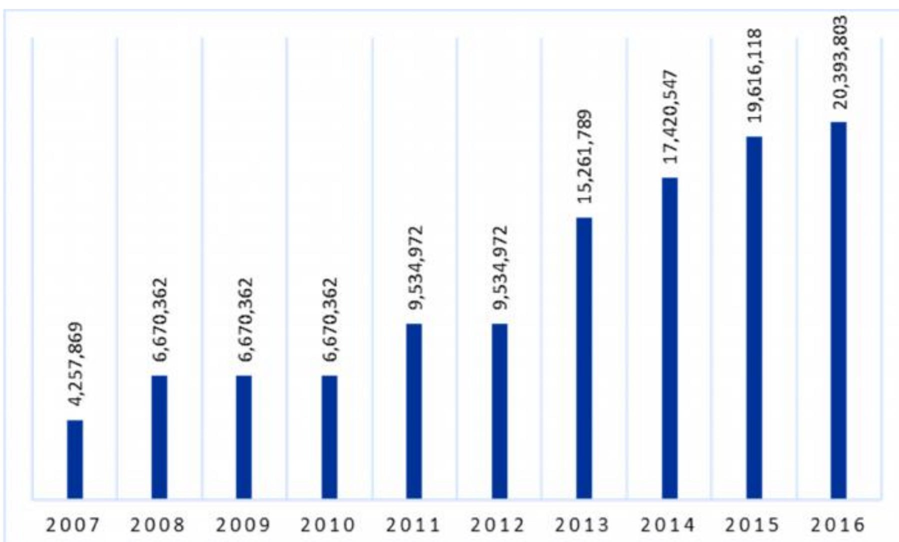

Figure 67: Cereals throughput in Port of Constanța 2007-2016 (tons)

(Source: www.constantza-port.ro)

Coal and lignite and crude petroleum throughput decreased from about 12 million tons in 2007 to about 5 million tons in 2016 with a drop in 2013.

[18] Pâslaru Sorin, *The proof that infrastructure contributes decisively to economic growth*, in Ziarul Fianciar, www.zf.ro, 6 March 2017.
[19] www.constantza-port.ro

Metal ores and other mining and quarrying products; peat; uranium and thorium traffic also registered on average a downward trend from about 14 million tons in 2007 to about 9 million tons in 2016. In 2012 Romania was situated on the 37th place worldwide in crude steel production with 3.3 million tons registering a 13% drop compared to the previous year when production sat at 3,8 million tons.

The Romanian iron ore and scrap trading has severely decreased in the period 2003-2012 by 71% in the case of imports and by 21% in the case of exports. This was mainly caused by the global recession, which had a major impact on the steel producers. However, starting in 2010 it began to pick up and maintained a rather steady volume until in 2016.

In the past 5 years, fertilizer traffic in the Port of Constanta has been variable, although there has been a significant growth trend until 2013. The average volume of fertilizers handled in Constanta Port between 2009 and 2016 has been of 1.8 million tons per year. Imports and transit mostly account for the growth trend observed, while exports have had peak years with nearly 1 million tons of cargo but have plummeted in less than a year’s time. In 2010, Romania’s total fertilizer consumption was of approximately 1,2 million tons, out which 63% was imported through the Port of Constanta. In 2016 the chemical and fertilizer minerals throughput almost reaches to 3 million tons.

In the past 5 years the food products, beverages and tobacco throughput has constantly increased from approximately 1,2 million tons in 2007 to 3,7 million tons in 2016. A major drop was registered in 2012 when the animal and vegetable oils and fats traffic decreased to 7.000 tons from about 2 million tons during the previous year.

Textiles and textile products; leather and leather products are not very much operated in the Port of Constanta. There was an upward trend from 143 tons in 2008 to 172.811 tons in 2012, but rapidly decreased and during the last three years 2014-2017 the port has no operated such cargoes.

Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products throughput has not presented significant a trend. There were ups and downs from about 1 million tons in 2007 to 600,000 tons in 2016.

A constant traffic of approximately 3 million tons was registered for coke and refined petroleum products (Liquid refined petroleum products), during the last 10 years. As a historically significant refining centre, Romania has a better position in the BMI downstream industry (refining and processing) ratings compared to the upstream industry (drilling and production). However, underinvestment and poor local demand have left their mark on the industry in recent years. Romania's large refining capacity remains the country's major downstream strength although most of the refineries are dated. The country has a theoretical refining capacity of 381.600 barrels per day (b/d) and has undertaken some upgrade work at major refineries. This refining capacity exceeds domestic consumption of refined products, providing the country with useful export capability, which currently aims at neighbouring countries and also Georgia. However, current utilization rates remain quite low.

Chemicals, chemical products, and man-made fibers (Basic mineral chemical product) throughput has decreased with 27%, from approximately 370.000 tons in 2007 to 100.000 tons in 2016.

The traffic of other non-metallic mineral products comprising of Glass and glass products, ceramic and porcelain products and Cement, lime and plaster, has a significant downward trend starting from about 4,5 million tons in 2007 to 173 tons in 2016.

The metal products industry evolution is closely related to the economic "health" mainly due to its direct correlation to the manufacturing industry and construction sector. Also, due to large uses of metal products in construction industry the two sectors tend to correlate.

The amount of Basic metals; fabricated metal products, except machinery and equipment handled by the Port of Constanta has decreased significantly after 2007 with approximately 50%, from approximately 3,7 million tons in 2007 to 1,9 million tons in 2016. In 2013, the volume of metal products handled by Constanta Port has cumulated around 1,6 million tons out of which imports hold the majority share, specifically 41%. The exports and transit made around 22% and 34%, respectively, from total handled cargo, the rest being represented by cabotage.

Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks throughput has increased from approximately 110.000 tons in 2007 to 340.000 tons in 2016.
The transport equipment handled (automobile industry products) presents an upward trend from 137.000 tons in 2007 to 360.000 tons in 2015. The 2016 year statistics reveal a significant drop to 3.500 tons.

The auto industry is the 6th largest industry globally according to the Romanian Association of Car Manufacturers. Romania is the third most important automotive market in CEE and its market is mainly based on low-budget car sales – the Romanian brand, Dacia Logan, is the cheapest European car. Given its cheap labor force, Romania is also one of the preferred investment locations for automotive suppliers. The existing carmakers in Romania are Renault and Ford.

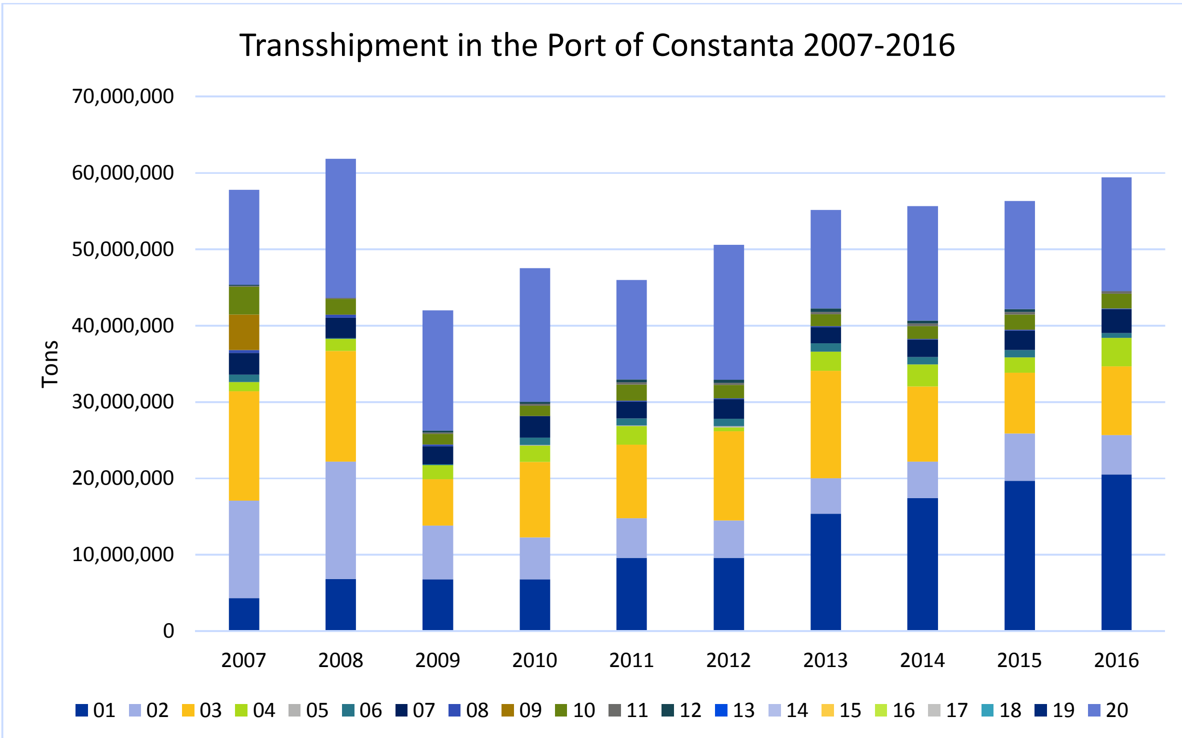

Figure 68: Transshipment in the Port of Constanta 2007-2016

(Source: iC consulenten, based on the data provided by MPAC)

5 Port infrastructure development projects

5.1 Port of Enns projects

5.1.1 Completed projects

The most important project in the last years was the great enlargement of the container terminal. The area was doubled and instead of one crane now 3 cranes are now active, the railway lines (block trains) came up from 4 to the number of 9 and in total a great European hinterland terminal could be established. Other smaller projects have been realized in the port area as erection of a new transhipment platform or 4 new storage silos of Fa. Bernegger and the debottlenecks of Fa. Fixkraft.

5.1.2 On-going projects

Stepwise development of the cargo City Enns by Fa. Kaindl which is one partner of the terminal company.

Availability of clean fuels: a LNG tank stop for trucks is still in erection / opening in Sept 2017; a LNG-strategy was elaborated in 2016/early 2017.

TO DO within the Daphne-project: further planning of infrastructure and market research and authority permission processes, preparation of next investment septs for barges, bunkering, storage, rail connection (ongoing until 2019).

5.1.3 Planned projects

Feasibility-study for a special part of the port (free space an quay 21); "Truck-Train-Ship-Handling station (TTS") especially for connection of Adria to the Danube (one of the nearest distances is Ennshafen port) and special transhipment station in case of problems with navigability of the Danube, especially upstream of Enns – very urgent, because Straubing-Vilshofen has no solution until 2030; so the rest of the Danube (downstream can work well in the future); this topic has to be crosschecked with container-cargo (backup, back-freight, …)

Feasibility and planning for rail connection improvement (the trimodal port Ennshafen has got very good infrastructure and enough space for growing; the port is dedicated as industrial space; in order to manage the needs in the future decades it is necessary to start strategic planning for the next level in railway connection to the port on the Upper Austrian side, which could be needed if the modular shift will go the actual way and temporary problems of IWW will happen due to weather conditions; in this case a backup-line for water and transport is necessary and will foster additional in/outbound capacity of the lines; additional the development of further connections to the hinterland (both closer hinterland and farer hinterland has to be performed because of foreseen capacity problems and even pressure to reduce truck traffic for the future due to environmental reasons

Surface pavement & drainage and precipitation water pre-treatment: the port activities and industrial parts were started 40 years ago; due to the mixture between port and private area all the utilities concerning drainage are a combined system; the situation is not state of the art according to strict Austrian (and even German) laws and a lot of improvement projects are necessary by force of the authorities and due to economic reasons (general maintenance of the areas, sometimes divestment of old very huge dimension, bring to a modern standard for new shipment equipment, …)

TO DO for Daphne-project: elaboration of a masterplan and preparation of further stepwise realisation for surface pavement & drainage systems (debundeling, divestments, separations, new strategic lines and cost estimations); the planning for good infrastructure development should be done within the project in order to perform a best practice standard for eco-friendly ports on the Danube ("Green deal for the Danube") that after/outside the project the respective investment projects could be started but in the way of a good environmental and economic friendly masterplan; this work and planning even contain the parts about precipitation water pre-treatment measures for the different port areas; some singular pre-treatment devices were built over the years a result in a lot of cost for the port infrastructure; the future parts have to be planned according to a masterplan respecting the total view to build up a best practice for the future for responsible care ports along the river Danube; a sustainable development is only possible if proactive planning is done an stepwise realisation in the next decade; otherwise problems may occur for port development in the future with severe impacts on general cargo situation on waterway

Special eco-friendly equipment: a lot of devices have been built in Enns due to special problems or authority papers and neighbourhood problems (e.g. installed oil barrier for a port basin; noise barrier along the railway line, …)

TO DO for Daphne-project: further investigation of eco-friendly equipment for the port infrastructure and suprastructure equipment (reducing diesel motor equipment, electric devices, …) and planning for modernization of general infrastructure equipment like camera system along the whole area in order to control the area, erection of special equipment for safety and security an roads and areas due to general development of situation in Europe (terror, ….), feasibility for special eco-labelling for ports, …

5.2 Port of Vienna projects

5.2.1 Completed projects

Port of Vienna has completed 5 port infrastructure projects in the recent period, until 2016. Those projects are listed and briefly explained in continuation:

OPTIHUB, 01/2013 – 12/2016

Based on a case study at the Port of Vienna, a standardised optimization system for multi-modal hubs was developed with new simulation algorithms. It analyses, combines and optimizes significant (administrative, operational and logistic) and innovative processes as well as location-based conditions. New goods with waterway transport affinity are identified to strengthen inland waterway transports.

Studies for the expansion of the trimodal port of Freudenau, 01/2012 – 12/2015
In recent years, the increase in container transshipments at the Port of Vienna-Freudenau has caused bottlenecks in terms of cargo handling space. Compared to 2010, container transshipments alone increased by 38% to nearly 442,000 container units (TEU) in 2011. The project consists of studies aiming to plan and design the expanded Port of Vienna Freudenau. The studies specifically look at extending the container handling capacities of the port. The project includes all the necessary steps from preliminary planning to obtaining the building authorisations and publishing the works tenders.

Expansion of the tri-modal inland port of Vienna by land recovery, 01/2012 – 12/2025
Freight handling capacity bottleneck, work phase of the above mentioned project. Involves extension of the port's container handling capacities through land recovery and the construction of a new quay wall in order to optimise the areas of operation.

Port mobile crane purchase and installation, 12/2014 – 12/2015
Although not exactly a project related to port infrastructure, Port of Vienna declared this project as an important one since it is related to capital equipment infrastructure. It involves a purchase of the new port crane and its installation on the quay wall.

Land recovery – Phase 2, 09/2013 – 12/2015
Expansion of the container transfer capacities in the Port of Vienna-Freudenau through land recovery and the optimisation of operative areas and thus an increasing of the storage capacity and transfer capacity form the basis for achieving the primary corporate objective.

5.2.2 On-going projects
Currently, there are two on-going projects in the Port of Vienna:

Planning and construction of the expansion of the trimodal Port of Freudenau, 01/2015 – 12/2025
This project involves addition to container handling capacities, including handling yards and waterside infrastructure. Relevant studies and designs are being made for the purposes of two-phased expansion of the container terminal.

Expansion phase 1 will be performed in two steps. In the first-step the empty container terminal will be moved from Terminal 2 to Terminal 3-new. Terminal 3- new will be operated with mobile container stackers. At the same time the water-side crane rail support and crane rail will be rebuild at Terminal 2-new, the land-side crane rail will be partially exposed.

In the second-step two gantry cranes will be constructed on the north-western terminal ending of Terminal 2- new on an area of approximately 80 m x 50 m.

In expansion phase 2 the rail tracks of Terminal 2-new are extended to block train length (650 m). Another loading rail track will be constructed. The access lines of Terminal 2-new as well as the feeder tracks will be electrified so that no traction change is necessary in the area of the marshalling yard. The existing rail connections of Terminal 2 will be demolished up to the location of the parking house. After the completion of the rail track construction works the crane rails of Terminal 2-new can be extended to block train length. At the northern end of the terminal a second crane repair area is planned. A third gantry crane will be set up. In Terminal 3-new only the adaptation of the tracks will be carried out in this expansion phase due to the expansion of the rail track system in Terminal 2-new.

Expansion container terminal construction Phase 1, 01/2013 – 12/2017
Following activities are either recently completed or are being carried out at the moment of writing of this report:

Terminal 2-new: Container transshipment is carried out by means of 2 gantry cranes. At the downstream end of the terminal a 45 m long crane repair area exists. The electric supply of the crane bridges already exists and is provided by the transformer in the roundabout. A total of 11 rows of containers with a length of approx. 600 m exist. The maximum stacking height is 5. Instead of 3 rows of containers north of the land-side crane rail, an optional container check area including stacking facility is possible. If needed the 2 water-side rows of containers at Terminal 2-new can be used as temporary parking lanes for trailer.

Next to the crane repair area, within the terminal section, connections for reefer container are planned. The remaining space in the north-western area can also be used as container parking area with stacking facilities or as parking area for trailers. For the transshipment of hazardous goods an interim parking area in the area of Terminal 2-new has to be included. The area in front of the new repair house, which can be placed at the downstream front side of the terminal, can be used for the transshipment of hazardous goods containers due to its separate collection and drainage of the surface water and its high quality surface structure. The remaining space in the north western area can be used as container parking area with stacking facilities with a capacity of 1,110 TEU or as parking space for 65 trailers.

Terminal 3-new: In Terminal 3-new the container transshipment will be carried out with container stackers. 13 rows of containers with a maximum stacking height of 6 and a total effective length of approximately 500 m can be set up. In the land reclamation area step 1 16 rows of containers with a stacking height of 6 are possible. The remaining spaces at both ends of Terminal 3-new will be also used as storage area for empty containers respectively as trailer parking spaces. After the completion of expansion phase 1 the following division for Terminal 2-new and Terminal 3-new can be made based on the northern terminal boundary.

Location of the expanded terminal, after the land recovery, is shown in Figure 69 below.

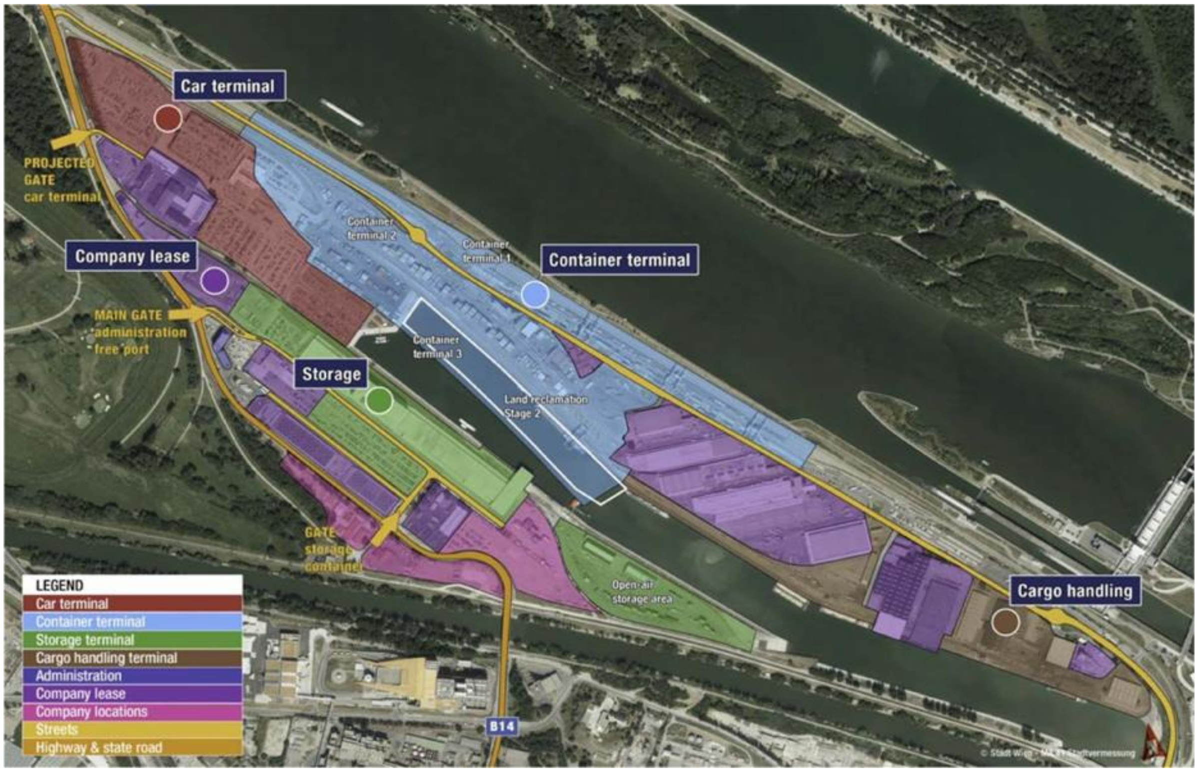

Figure 69: Planned expansion of the container terminal

(Source: Courtesy of Hafen Wien)

5.2.3 Planned projects

Port of Vienna has one planned project, based on the project list reported to the study team of the Rhine-Danube Core Network Corridor study. Following information are currently available.

Improving of the multimodal interconnections at Port of Freudenau,
unknown start and end date

The project aims at the expansion of the container transshipment capacities at the port through land reclamation and optimisation of operational areas to increase storage capacity and handling performance. The proposed Action includes activities to optimise the operational areas to increase the storage and transshipment capacities and improve the multimodal interconnections of the container transshipment area at the port by reorganising the rail track system.

This project will involve the second expansion phase of the currently on-going container terminal expansion. At Terminal 2-new, container transshipment is carried out by means of 3 gantry cranes. At both terminal fronts a crane repair area with each 45 m respectively 40 m of lengths. For the rail-side transshipment 2 loading rail tracks in block train length as well as a new loading rail track with a crane able length of 600m exist. A total of 9 rows of containers with a length of approx. 650 m are available. The maximum stacking height is 5. On both fronts of the container storage area connections for reefer containers are planned. However, the possibility exists to set up a stacker operated container check area.

The remaining space in the north western area can be used as container parking area with stacking facilities with a capacity of 240 TEU or as parking space for 11 trailers. After the completion of expansion phase 2 the expansion of Terminal 2-new will be completed.

In Terminal 3- new the container manipulation is carried out with stackers. The organisation of the terminal will be carried out as described in expansion phase 1. Regarding the container stacking area no considerable difference exists when compared with expansion phase 1. After finishing expansion phase 2 and based on the northern terminal boundary the following division for Terminal 2-new and Terminal 3-new can be made.

5.3 Port of Bratislava projects

In the last couple of years Port of Bratislava was preparing a lot of development projects which could help the port to making progress. From the 2012 there were fully implemented 3 projects, from which 2 were co-financed from INTERREG programme and one was co-financed by national operational programme. VPAS (Public ports j.s.c.) is currently preparing number of projects, which could be implemented in the near future. For the company the most important of all projects is the Modernization of public port of Bratislava.

5.3.1 Completed projects

VPAS has finished 3 project between 2012-2016.

Project INWAPO – Upgrading of Inland Waterway and Sea Ports. With the support of the Transnational program Interreg Central Europe project INWAPO was implemented. All together 15 project partners from 7 European countries (Slovakia, Hungary, Czech Republic, Austria, Poland, Italy, Slovenia) has participated in the project implementation. The INWAPO project was focused on improvement of coordination between official entities and other stakeholders, on increasing the competitiveness of waterborne transport as an alternative to road transport and on development of cooperation on intermodal logistics. The main objective of the INWAPO project was to provide support for making investments into intermodal infrastructure, information and communication technologies and applications for inland ports and seaports and thereby creating opportunities to provide a broader range and higher level of quality service. The project was focused on improving the connections of Central European ports to Hinterland and on creation of the conditions for integration and coordination of various modes of transport in the Central Europe. Implementation period of this project was 10/2011-12/2014. Total eligible costs of the project were 3.809.000 EUR. Main outputs for Public ports, jsc (VPAS):

- Market study–Possibility to transport wheeled vehicles and container units through inland waterways,
- The study of software and hardware solutions to support the process of transfer of cargo from ship to shore and vice versa,
- Study Cashless payments via Information systemfor management and fees collection for the Public Ports, jsc. customers
- Study Direct access for customers of Public ports, jsc. into Informations system
- for management and fees collection.

Project DaHar - Danube Inland Harbour Development for development of inland ports on the Danube was successfully completed in March 2014. The project aimed to create a common strategy for inland ports in small and medium-sized cities on the Danube to encourage additional development and to enhance their international importance. The primary objective was to contribute towards improved integration of inland navigation into a universal logistics transport chain focused on multi-modal and the logistics development of ports and port areas along the Danube in a European context. Implementation period of this project was 04/2011-03/2014. Total eligible costs of the project were 1.966.100 EUR. One of the most important outputs of the DaHar project was the Local Action Plan for Public ports, jsc. which defined action objectives, the primary areas of development and specific activities in the following areas: logistics infrastructure and models for operating public ports in the Slovak Republic, improved integration of Bratislava Port with domestic rail and road transport networks, integration of ports into the container and Ro-Ro services system on the Danube, radar information systems and information technologies supporting port management and cargo transport, navigability, remedy of environmental burdens and active environmental protection efforts. The Local Action Plan includes specific financial requirements for the individual areas of development and represents a reference point for drafting investment activities completed in the European INWAPO project.

Safety project and Emergency plan of the public port Bratislava - was supported by the Operational programme Integrated Infrastructure 2014-2020, priority axis 4 –Infrastructure of water transport (TEN-T CORE), Specific objective 4.1 –Improving quality of services provided in the public port of Bratislava. Main objective of the project was to elaborate the Safety project and Emergency plan of the public port Bratislava in the following range :1. Security project: the role of Security project is to provide suggestions for security measures in the area of public port Bratislava (in line with the unified security measures applied in other Danube ports). The Emergency plan reflects on the Security project. 2.Emergency plan: content of Emergency plan consists of set of written and graphic documentation including general part, standby and operative part. Thanks to the project, the security aspects of the potential risks are identified and measures aimed at their elimination or reduction of existing unacceptable risks are suggested. The project proposes to create zones with control and risk management. Safety documentation reflects the specific status and competencies of the Public ports, jsc. as well as the strategic planning of future development of the public port Bratislava. Implementation period of this project was 05/2016-11/2016. Total eligible costs of the project were 30.391,81 EUR.

5.3.2 On-going projects

Port of Bratislava is the project partner in 3 on-going projects:

Danube Ports Network – DAPhNE - The total budget for the project is 2.985.406,15 EUR out of which the Public ports, jsc. has been allocated 188.255,00 EUR. Project began on January 1, 2017 and is expected to finish on June 30, 2019. The project plans to establish a well-managed permanent platform of partners for cooperation on issues of common interest in the field of port legislation, port administration, management and port development. The platform will allow for long term exchange of information and will solve the most urgent shortcomings through guidelines, recommendations and specific pilot actions based on best practice. The aim is to ensure better coordination and transnational integration by pilot activities and common Instruments developed by private and public members of platform. This will lead to common approach in the revision and harmonization of the legislation, administration and management of ports in the whole Danube region. Cooperation will strengthen the institutional capacities of the Danube ports as key actors in sustainable transport and economic growth. At the same time their economic and environmental performance will be supported. Through systematic collaboration, the project aims to establish a common development strategy and to harmonize instruments, such as state aid schemes, to stimulate public and private investment in ports. The main expected outcome of the project is to establish a platform of Danube ports comprising approximately 120 members who will represent the entire community of the Danube. Members will have free access to project deliverables and outputs and the platform will serve as a basis for future innovative projects aimed at sharing experience and increasing capacities. In the above-mentioned output, the company Public ports, jsc. will actively participate in the following activities:

- improvement and harmonization of port legislation and the identification of state aid schemes, which could potentially be used for port development.
- explore the possibilities for development of port infrastructure and industry in response to innovation and market opportunities, as well as explore the option of public-private partnership to ensure the investments
- establishment of a functioning network of ports to implement the Development Strategy of the Danube Ports.

The main task of the Public ports, jsc. is to participate in creation of various documents and participate in the test version of the communication system.

Project Danube - Black Sea Gateway Region - *Regional and Transport development in the Danube – Black Sea Region towards a Transnational Multiport Gateway Region* **-** The total budget for the project is 2.200.000 EUR out of which the company Public Ports, jsc. has been allocated **136.220,00 EUR**. Project began on January 1, 2017 and is expected to finish on June 30, 2019. Even though the Danube-Black Sea region has the opportunity to become a very important gateway for cargo transport from Central Europe to the Caspian region and further to the Far East, the current status of infrastructure and organizational structure will not be sufficient to take over the envisaged global role and rising demands in transport. In global competition with other modes of transport, the Danube-Black Sea gateway region has to promote its profile and learn from examples of good practice in other regions. The main objective of the project is to prepare the Danube-Black Sea region to become an attractive gateway region for cargo transport from Central Europe to the Black Sea, the Caspian region and the Far East. The aim of the project is to improve the sustainability of the transport system, to strengthen the cooperation between the regional partners and to increase public awareness on tie opportunities the Danube-Black Sea region can offer. The aim is also to improve the business environment and to attract the cargo together with business in this region. Based on that, it is possible to take advantage of the current development and business potential of the ports in Danube and Black Sea region. The main outcome of the project is the elaboration of a Joint Vision 2040 for sustainable transport for the Danube-Black Sea Region and delivery of a detailed work plan based on pre-identified measures, lack of services, know-how, etc. The project will create a cooperation platform with common vision for all key actors in the region. Selected pilot actions based on a Joint Vision 2040 and the work plan will be elaborated. The main task of the Public ports, jsc. is to participate in the individual work packages and contribute to the implementation of the pilot action.

TalkNET-Transport and Logistics Stakeholders Network - All together there are 18 partners from 9 countries involved in the project. The total indicativebudget for the project is 4.388.000 EUR out of which the company Public Ports, jsc. has been allocated indicative budget of 136.220,00 EUR. The main objective of the project is to improve and strengthen the coordination of freight transport stakeholders in central Europe in order to foster the integration between ports/inland terminals and transport operators and enhance efficient and environmentally- friendly multimodal logistics nodes (ports and freight villages). The optimization of transport modes and their combination in transnational multimodal chains will support the overall programme goal: to develop a freight transport system in central Europe that is able to offer sustainable accessibility to and from the central European markets and strengthen their competitiveness. In order to achieve this goal, TalkNET plans to create and enhance the coordination among the network of freight transport operators in order to improve the efficiency of multimodal nodes and related logistics services. Coordination will be focused on the management and connectivity of the ports/inland terminals and their environmental performance to implement multimodal environmentally-friendly platforms and services.Public ports, jsc. has, among others, competencies in preparation and implementation of the construction of public ports infrastructure, including elaboration of short-term and long-term development concepts. These company visions are clearly linked to the project main objectives, which are as follows: integration of the port terminals and transport operators (mainly railway and IWW); improvement of efficiency and sustainability of the node/terminal.

5.3.3 Planned projects

Feasibility study for the Modernization of public port of Bratislava - The Feasibility study needs to be understood as a first step to identify the extend of the works necessary to be implemented in the second stage for the whole Modernization of the public port of Bratislava. It also includes CBA and EIA in order to facilitate the smooth implementation of works.

Modernization of infrastructure in cargo port Bratislava and completion of bollards in cargo port - Within the last 20 years the port faces lack of the investments in the modernization of port infrastructure. Due to this fact the port infrastructure is in a very bad and unsatisfactory technical condition not meeting the safety requirements. It is therefore necessary to modernize the port infrastructure so that the public port of Bratislava meet the current requirements for safe landing and berthing of ships. The scope of works is defined by the Feasibility study for Modernization of public port of Bratislava.

Modernization and completion of the port quays and hard standings - Due to the planned relocation and transhipment of goods and bulk materials from the Winter port area to the basin Pálenisko hard standings need to be built. At the same time, it is necessary to complete the port quays serving for loading and unloading of goods and materials. The scope of works is defined by the Feasibility study for Modernization of public port of Bratislava.

Passenger port - Phase 1 - The need to implement this investment project is based on development concept of public ports approved by Government Resolution no. 846/2010, while considering using this port for the development of public passenger shipping, as this area is located near the city centre of Bratislava.

Passenger port - Phase 2 - The promenade in this section is divided into three levels. The first level of the promenade is located at the level of Bratislava's pedestrian zone. The second level of the promenade is a new level at the Danube waterfront's edge, the third level of the promenade is at the water level.

Passenger port - Phase 3 - section, that facilitates closer and safer access to the Danube. The promenade will be used for rest and sports activities for the public and for short-term berthing of small sporting vessels and their long-term berthing between the pontoons and the shore as well as berthing of large passenger and cabin vessels.

Port Safety Protection - Phase 1 - Project is aimed at ensuring physical, environmental and fire protection and safety of the ports in order to reduce the reaction time in case of accidents on the waterway, in the basins or in the land areas of the ports. In a first phase the studies will be prepared in order to facilitate the physical implementation of the works in the second phase.

Port Safety Protection - Phase 2 - Physical implementation of the works which were defined in first phase of the project.

Waterway public transport - Phase 1 - The addition of stops on the Danube waterway is proposed with the goal of supporting workforce mobility, alleviating extreme traffic and using a more ecologically-friendly form of passenger transport.

Waterway public transport - Phase 2 - The second phase of the project includes a plan to complete the pool/wharf for berthing the vessels used on the regular connections outside of operating hours or at times outside of the main hours of operation.

Construction of the LNG Terminal in public port of Bratislava - Phase 1 - The aim of the project is not only to contribute on the modernisation of services in public port of Bratislava but by the support of loading of infrastructure for alternative fuels to contribute on decreasing the negative impacts on the environment. Realisation of the project will contribute to the ecologisation of public port of Bratislava in accordance with the loading requirements of alternative fuels in the public ports within European Union. Project implementation will start on 1/2018, but the public procurement on the feasibility study has started on June 2017.

Construction of the LNG Terminal in public port of Bratislava - Phase 2 - Project is aimed at ensuring construction of the LNG terminal incl. bunkering station for LNG transfer on the Danube river and bunkering options for vessels. The terminal will also serve for the other transport modes as a fuel station.

5.4 Port of Komarno projects

Port of Komarno is part of all transnational projects implemented by VPAS (Public Ports j.s.c.). Currently the most important of the projects in Komarno is the Modernisation of Komarno public port.

5.4.1 Completed projects

Project INWAPO – Upgrading of Inland Waterway and Sea Ports. With the support of the Transnational program Interreg Central Europe project INWAPO was implemented. All together 15 project partners from 7 European countries (Slovakia, Hungary, Czech Republic, Austria, Poland, Italy, Slovenia) has participated in the project implementation. The INWAPO project was focused on improvement of coordination between official entities and other stakeholders, on increasing the competitiveness of waterborne transport as an alternative to road transport and on development of cooperation on intermodal logistics. The main objective of the INWAPO project was to provide support for making investments into intermodal infrastructure, information and communication technologies and applications for inland ports and seaports and thereby creating opportunities to provide a broader range and higher level of quality service. The project was focused on improving the connections of Central European ports to Hinterland and on creation of the conditions for integration and coordination of various modes of transport in the Central Europe. Implementation period of this project was 10/2011-12/2014. Total eligible costs of the project were 3.809.000 EUR. Main outputs for Public ports, jsc (VPAS):

- Market study–Possibility to transport wheeled vehicles and container units through inland waterways,
- The study of software and hardware solutions to support the process of transfer of cargo from ship to shore and vice versa,
- Study Cashless payments via Information systemfor management and fees collection for the Public Ports, jsc. customers
- Study Direct access for customers of Public ports, jsc. into Informations system
- for management and fees collection.

Project DaHar - Danube Inland Harbour Development for development of inland ports on the Danube was successfully completed in March 2014. The project aimed to create a common strategy for inland ports in small and medium-sized cities on the Danube to encourage additional development and to enhance their international importance. The primary objective was to contribute towards improved integration of inland navigation into a universal logistics transport chain focused on multi-modal and the logistics development of ports and port areas along the Danube in a European context. Implementation period of this project was 04/2011-03/2014. Total eligible costs of the project were 1.966.100 EUR. One of the most important outputs of the DaHar project was the Local Action Plan for Public ports, jsc. which defined action objectives, the primary areas of development and specific activities in the following areas: logistics infrastructure and models for operating public ports in the Slovak Republic, improved integration of Bratislava Port with domestic rail and road transport networks, integration of ports into the container and Ro -Ro services system on the Danube, radar information systems and information technologies supporting port management and cargo transport, navigability, remedy of environmental burdens and active environmental protection efforts. The Local Action Plan includes specific financial requirements for the individual areas of development and represents a reference point for drafting investment activities completed in the European INWAPO project.

5.4.2 On-going projects

Master plan and feasibility study for the Komarno port - The public port of Komárno is now situated on the left bank of the Danube at river kilometers 1770,00-1762,00. The port is the starting point of the Váh Waterway. The location of the port is partially on the river bank and partially in the shared basin of the port and the shipyard. The port, divided into western and eastern sections, covers an area of more than 20 ha, but it is located on the relatively narrow territory close to the town center and residential area of the city of Komárno. In addition, the eastern part of the port is situated on the edge of the designated historical zone of the town and it is very close to a national historical landmark. The reasons for the elaboration of the Master plan and Feasiblity study are based on limitations of development of the existing Komárno port:

- Environmental aspect – Dust and noise coming from the cargo port, which is located close to a historical city center and a residential zone,
- Traffic congestions due to the bridge over the port basin, which opens whenever a vessel needs to get to Western part of port. Traffic due to trucks passing through residential area
- Cultural aspect – close proximity of the cargo port to a landmark declared as a world heritage site of UNESCO
- Economic and environmental aspects – low efficiency of very outdated equipment, high energy consumption of old transshipment technologies beyond their lifespan, high level of emissions, high operational costs to maintain functional machinery
- Expensive maintenance required in order to make the equipment functional, which leads to low interest for business to use the port and thus lower possibilities to renovate the port with its own funds.

The proposed action consists of the two main activities: elaboration of Master Plan and Feasibility Study for the Komárno port as part of the development process of the port that fits into the global project.

Master Plan is Strategic development plan of the Komárno port that will include especially:

- Analytical part: analysis of the port´s relations, structure, its functioning, demand analysis and comparison with similar ports,
- Strategic part: models of developments and their advantages, conditions of their implementation, financial and socio economic impacts and SEA

The preparation of Master Plan is the prerequisite for further elaboration of the Feasibility study.

Feasibility study that reflects the Master Plan is considered to be a fundamental methodical (systematic) document for further development and investments into port´s development. The study will consist of:

- the assessment of the feasibility of different alternatives, analysis of the most suitable arrangement including technical and financial analysis, risk and sensitivity analysis,
- a Cost Benefit analysis (CBA)
- and Environmental Impact Assessment (EIA)

TalkNET-Transport and Logistics Stakeholders Network - All together there are 18 partners from 9 countries involved in the project. The total indicativebudget for the project is 4.388.000 EUR out of which the company Public Ports, jsc. has been allocated indicative budget of 136.220,00 EUR. The main objective of the project is to improve and strengthen the coordination of freight transport stakeholders in central Europe in order to foster the integration between ports/inland terminals and transport operators and enhance efficient and environmentally- friendly multimodal logistics nodes (ports and freight villages). The optimization of transport modes and their combination in transnational multimodal chains will support the overall programme goal: to develop a freight transport system in central Europe that is able to offer sustainable accessibility to and from the central European markets and strengthen their competitiveness. In order to achieve this goal, TalkNET plans to create and enhance the coordination among the network of freight transport operators in order to improve the efficiency of multimodal nodes and related logistics services. Coordination will be focused on the management and connectivity of the ports/inland terminals and their environmental performance to implement multimodal environmentally-friendly platforms and services. Public ports, jsc. has, among others, competencies in preparation and implementation of the construction of public ports infrastructure, including elaboration of short-term and long-term development concepts. These company visions are clearly linked to the project main objectives, which are as follows: integration of the port terminals and transport operators (mainly railway and IWW); improvement of efficiency and sustainability of the node/terminal.

5.4.3 Planned projects

Modernisation of Komarno public port - The goal of the Modernisation of Komárno Public Port project is to restore its place in the national economy and within the international TEN-T network corridor. Given that the current location of the port is in close proximity to the residential and historical core of the city of Komárno, there is a long-term need to transfer cargo transport to a new location.

5.5 Port of Komarom projects

5.5.1 Completed projects

MAHART-PassNave Ltd. applied for the New Széchenyi Plan Transport Operational Programme (hereinafter: KÖZOP) for the modernization of port and public lighting in 2014, which resulted in the granting of HUF 60 million by the European Union and the State of Hungary, with the co-financing of the Cohesion Fund. The project was launched in March-June 2015.

KÖZOP-4.7.0-15-2015-0018 Purchase of equipment for Port Danube Ltd.'s range of services to be expanded

Total net cost of the project was HUF 25.510.000. Amount of support was HUF 21.683.500. The development is funded by the European Union and the State of Hungary, co-funded by the Cohesion Fund.

The development of the port was linked to the investment implemented by Port Danube Ltd. with EU support. The development of the port's freight activity will also be promoted by expanding the service offering of the Company. In order that, new equipment will be purchased to increase the efficiency of carrying goods.

This development was justified by the formerly low utilization of the potential of river navigation. IWW capacity of the Danube is up to 10-20% of the Rhine, however, this mode of transport is considerably more favourable than almost any parameter in terms of road or airways. Therefore, project aimed this mode of transport to be better exploited by using an efficient, intermodal terminal (combining multiple tools and modes) linking the Danube waterway freight transport with rail and road, reducing road congestion and load.

Water transport ensures the efficient transfer of goods, thus, in this project, Port Danube Ltd. set up two tools to increase the efficiency of moving goods. Firstly, a unique conveyor belt tailored to special, local needs, which is primarily suitable for moving bulk goods e.g. cereals, fertilizers, pellets etc. The other equipment is a Bobcat S570 loader with spoon. This is a well-known loader, which is extremely manoeuvrable and efficient. The machine weighing only 2.9 tons being able to hold 1 ton. The goal of investing and introducing the two equipment was to increase the efficiency of loading and unloading, enhancing the competitiveness and economy of watery freight. The project is linked to another development project of the company, that is:

KÖZOP-4.1.0-13-2013-0003 Implementation of enhancements to increase intermodal capacity at the Port of Komarom

Total budget of the funding contract: HUF 761.412.660. The objectives of the project were to link different modes of transportation, develop economical centres' intermodality and transportation infrastructure.

The project contributed to a long-term goal of the port, i.e. to become a National Public Port. To achieve this goal, works have begun in Komarom, where modernization of the freight terminal and the modernization of trucks and transhipment of vessels are being implemented. In the framework of the project, Port Danube Ltd. makes the shore suitable for quick carrying of industrial scale shifts, and a pavement built on the high side by means of road transport to temporary storage of materials (containers) on the ground. By modernizing the shipyard, water transport significantly relieves long-distance road transport.

5.5.2 On-going projects

There are no currently on-going projects in the Port of Komarom

5.5.3 Planned projects

Master Plan and feasibility study for the development of the TEN-T ports, including Komarom Port

Project is planned to be implemented between August 2016 and April 2018, though it has not begun yet. There is a CEF grant with amount of EUR 1.05 million that could be dedicated to the project implementation after a successful application.

Located on the Hungarian stretch of the Danube on a pre-identified section of the Rhine - Danube Corridor, Port of Komarom's upcoming planned project aims to improve basic ports infrastructures, provide access to the inland ports and foster their connections with road and inland waterway networks. It is part of a global project to develop and upgrade the overall Rhine - Danube Corridor to reach stable navigation throughout the year. It encompasses four Activities: project management, master plan development, feasibility study and case studies. The outcome of the studies will lay the ground for future port development by setting strategic directions and development priorities after 2020.

5.6 Port of Budapest projects

5.6.1 Completed projects

KÖZOP-4.7.0-15-2015-0045 Development of basic infrastructure of MAHART Hungarian Shipping Co. Ltd. in the Freeport of Budapest

Project was cofounded by the European Union, it was implemented in June-November 2015. MAHART won a grant of 74,94%, amount of HUF 52.175.100 for the realization of the project. Total budget of the project was HUF 69.622.498. The main objective of the project was to increase the availability of services provided in the Freeport. MAHART planned to establish a point of entry and exit at the meeting point of public and private areas at the port. The entry and exit points are mainly for registering vehicles, and if necessary, controlling and loading heavy goods vehicles. Through the development of the port infrastructure, 2950 m^2 of land was provided with a solid enclosure. With the implementation of the investment, the level of parking and related services has been increased and improved, resulting in a better access to the use of port services. By establishing the facility, a safer, more controlled management of internal traffic became possible.

KÖZOP-4.5.0-09-11-2012-0003 Implementation of the 1st Phase of the intermodal and capacity-building development of the Freeport of Budapest

Project was cofounded by the European Union and it was implemented in 2013-2015. MAHART won a grant of 92,5%, amount of HUF 2.996.361.300 for the realization of the project. Total budget of the project was gross HUF 3.238.755.000. It contained:

- modernization of exterior and Mirelite railways;
- development of north-western corner of the 2nd pool;
- construction of small open loaders;
- illumination of the 5th extraction track;
- north connecting road – north;
- north connecting road – south and roundabout;
- north-south connecting road;
- construction of parking lot no. 4.
- reconstruction of tracks and pavement at the Grain warehouse;
- reconstruction of freight trains and pavement

5.6.2 On-going projects

IKOP-2.1.0-15-2016-00025 MAHART Mobile Flood Dam

The implementation period of the project is between 30 September 2016 and 31 October 2018.

Project is cofounded by the European Union with the amount of HUF 1.359.376.000 that is a 100% grant.

Strategic goal is to ensure the flood protection of the dynamic and developing Freeport with a central role in the Danube region. The main objective of the project is to ensure product protection in the port by realizing the investment.

Operational objective is periodic flood risk times recurring regularly recently, to represent a minimum risk and shutdown for BSZL and its lessees.

Project includes the construction of mobile gates on the flood protection line, based on the height of the quay, with two types of artwork geometry for the related filling and barrier construction work.

After implementation, a multi-use structure will be completed protecting against water, largely decomposed beyond the protection period. An essential aspect of its overhaul is the need to place flood control tasks on the designability of deployability more emphasis. Accordingly, the planned height of the flood protection line on the section to be harvested is 103,93 a.s.l.

The project also includes the construction of a building for the storage of barriers, which are halls covered and enclosed, which do not require temperament, totalling 600 m^2 floor area.

5.6.3 Planned projects

PAN-LNG-4-DANUBE, 06/2016 - 09/2019

In the frame of this project for EUR 10.11 million under CEF's Innovation call, a tri-modal LNG terminal will be installed with availability of fixed LNG extracting, storing and refueling. By implementing this project, the established station would serve not only LNG propelled vessels but also LNG trucks and most probably trains as well. Furthermore, the Action foresees to retrofit existing vessels with LNG propulsion. The Action will study the design of the innovative LNG related infrastructure, will implement, and disseminate appropriate related results.

The scope of the project is completing a feasibility study on what sort of clean fuels and for which ways of transportation can be introduced. Study will examine how the project contributes to the development of the Freeport and how effectively could it decrease costs. What type of stakeholders could support this Action to be implemented and what sort of further improvements need to be completed at the port to be successful. Besides the background works and analysis, there will be procurement of equipment and development of new fuel stations.

Port infrastructure development 01/2014 – 12/2018

In the frame of an ever-redesigned project for port infrastructure development is planned to be continued in between 2016 and 2018. In the second half of the 2000s a large-scale feasibility study started to discover the most important directions of development. By 2012 stakeholders of the Freeport identified 31 major project elements that must be implemented to have a higher-end freight port in Csepel Island. By 2015, 9 of them have been completed for approx. HUF 3,3 billion, while rest of them remained as plans, and hopefully, could be implemented from an amount of approx. EUR 1.05 million by CEF CNC call.

Construction of the northern connection road – north	completed
Construction of the northern connection road – south	completed
Construction of the north-south connection road	completed
Reconstruction of the outdoor loading and unloading facilities and tracks	completed
Capacity building of the tracks at the barn building (Grain warehouse)	completed
Upgrading the tracks of Mirelite Csepel Hűtőipari Kft. and those located on the periphery of the Freeport	completed
Construction of the small outdoor loading and unloading facilities	completed
Illumination of switching lead No. 5	completed
Construction of truck parking lot No. IV.	completed
Capacity upgrading of tracks 10-11-12	planned
Construction of road network of the north-western corner of basin No. II.	planned

Reconstruction of pavements of organizational tracks of the 28th and No. V, VI	planned
Building a security system for gate No. 3	planned
Construction of the southern connecting road	planned
Coast protection on the south-eastern corner of basin No. II.	planned
Restoration of the northern side of the entrance channel	planned
Renovation of internal road network – capacity building improvement – "a"	planned
Renovation of internal road network – capacity building improvement – "b"	planned
Renovation of internal road network – capacity building improvement – "c"	planned
New quay-side railways	planned
Restoration of sloped quays on Danube side	planned
Organizational tracks	planned
Port for heavy goods	planned
Strengthening Petroleum Basin	planned
Dredging and geometric transformation of the petroleum basin	planned
Development of car parks	planned
Development of parking places for trucks in Grain warehouse	planned
GIS for traffic control and trimodality	planned
South link to the MÁV track network	planned
Transit parking	planned

Upgrading the railway link to Budapest inland Freeport, 01/2016 – 02/2018

In the framework of this project, also under CEF CNC call, there will be developments from 2016 to 2018.

The project will deliver the preparatory studies to upgrade the railway connection of the port to the national grid by developing railway lines in between Soroksár and Corvin node. The project is part of a global project that aims to improve the 1,5 km long railway link connecting the port to the Orient-East-Med and Rhine-Danube Corridors. The Action consists of four activities including project management, preparation of feasibility study and cost-benefit analysis, design for the construction of a provisional bridge, and permit designs for the upgrading of the port railway node. The action will have a positive impact on congestion, interoperability, service quality, safety and security.

5.7 Port of Slavonski Brod projects

5.7.1 Completed projects

No infrastructure projects (work phases) have been completed in the recent period (2012-2016). However, earlier projects were related to the most important infrastructure project, as follows:

- Construction of roads and infrastructure in the port area (3.058.523 €, 2007-2011)
- Construction of infrastructure (banks) (519.480 €, 2007)
- Technical documentation i.e. main and detailed design of infrastructure in the port area of port of Slavonski Brod (1.253.313 €, 2007-2010)
- Construction works (geotechnical works and archaeological research) 3.508.325 €, 2015
- Land acquisition (1.428.343 €, 2015)

5.7.2 On-going projects

Two infrastructure projects are currently being implemented in the Port of Slavonski Brod:

- **Passenger dock construction**: the passenger dock consists of pontoon for berthing ships. Tanker barge will be reconstructed for this purpose. The project started in 2015 and will be completed in 2019.
- **Dangerous cargo terminal**: waste Reception and bunkering terminal, provides refuelling fuel for ships and removal of waste from the ships in an environmentally friendly way. Consists of dock with a length of 90 meters with two fuel tank capacity of 1000m3 and other equipment for waste disposal. The project started in 2015 and is planned to be completed by the end of 2020.

5.7.3 Planned projects

Most important project being planned for implementation in the forthcoming period is the project called “Infrastructure upgrading and development of terminals and supporting facilities in port of Slavonski Brod”. This project implementation will fully contribute to the realization of project objectives, as follows:

- Develop basic port infrastructure that will act as a functional unit and a basis for further development of the port,
- Introduce modern port services,
- Improve inter-modality,
- Provide incentives to the economic development within the port area, the hinterland, the wider region in the narrow and broad sense,
- Create synergies with other transport initiatives, which improve the system of river transport on the Sava river.

Most important aspects of the project are the construction of the quay walls 4 and 5 which are an extension to the existing quay no. 3 constructed in 2004. Works on the construction of this part of the port infrastructure will include the construction of bank structures, foundation structures and the upper structure, construction of track facilities and handling areas' planning, the construction of the electricity supply system and the construction of storm water drainage and water supply system. The construction of bank structures (foundation and upper structures) is necessary in order to allow for the mooring of vessels, so that the dimensions of the bank will therefore be conditioned by the size of the vessels that would moor there and the environmental conditions in which the quays should be constructed.

The existing vertical bank of the quay no. 3 is connected to the vertical bank of the quay no. 4, of total length, at the central longitudinal axis, of 106.7 m in the arch of 500 m radius. The vertical bank of the quay no. 5 is connected to the vertical bank no. 4 and should be constructed in the length of 121.1 m, in the direction of the central longitudinal axis. The vertical bank should be constructed as reinforced concrete structure. The working plateau of the vertical operative coast is 227.8 m long and 11.6 m wide. In order to permit the mooring of the composition to the vertical bank under all sailing conditions, in addition to these activities, it will be necessary to deepen the bed of the river Sava to the elevation of 78.00 m asl. This deepening is to be performed along the vertical bank and spreading to the middle of the river. It would be performed after the construction of the complete vertical bank and before the planning of the sloped bank, from the downstream side.

The vertical operational quay will be equipped with a number of elements necessary for the smooth functioning of the port in terms of mooring and loading of ships, fixing the structures so that, in exploitative conditions, it will be possible to use them according to assumptions in the static calculation, and ensuring the review of structures during regular inspections and maintenance. Within this action the construction of track facilities and manipulation area is foreseen. Both previously built quays are connected to the quay no. 3, while respecting the distance between tracks 4 and 5, as well as the track for the reloading crane. Equivalent rails and equivalent fastenings are to be used. Electricity supply system will be constructed. Power supply of distribution boards will be underground, by laying cables in the cable trench. It is planned to install the portal cranes in the area of quays no. 4 and 5, and it is necessary to ensure the power supply of sufficient power for their functioning. Since there are no plans for any surface facilities in the area of quays no. 4 and 5 besides the portal cranes, the cabinets will be placed in manholes. As integral part of this activity is the construction of storm water drainage and water supply system. The purpose of the storm water drainage is ensuring controlled collection of all liquid that can be accumulated on impermeable surfaces of working and manipulative plateau of quays no. 4 and 5. The storm water drainage system is a closed system that collects rainwater, washing wastewater and incidental leakages of petroleum products and other liquids. The system consists of the drains, watertight pipes, manholes, and sedimentation tanks and separators of fats and oils, which are located at the end of the system. The water supply connection of quays no. 4 and 5 of the port Slavonski Brod is connected to the water supply system of the port area in the node V1. The total length of water supply connection of quays no. 4 and 5 of the port Slavonski Brod is approximately 175 m long. In order to ensure port functioning within this activity cranes and handling equipment will be installed: 2 mobile portal cranes with grab and hook for unloading and loading and with 8/16 tons capacity, and 1 crane with 16/32 tons lifting capacity for loading/unloading. This activity contributes directly to the upgrade of port infrastructure and creating of preconditions for the provision of new and advanced services in the port.

Second most important aspect of this project is the construction of industrial railway tracks and internal roads, as well as the development of the terminal itself. This aspect is focused on organizing a set of interrelated operations which includes construction of track facilities, roads, parking and handling areas, construction of storm water drainage and sanitary-fecal waste water drainage system, construction of the water supply system and telecommunications distribution infrastructure (TDI) system and ultimately the establishment of container and Ro-La terminal. The activity will start with the planning of Track facilities, roads and parking works and handling areas. The route of industrial tracks will meet the following requirements: connect with the existing railway industry base, compound with bank tracks on the vertical banks of quays no. 3, 4 and 5 and the Ro-La terminal and container terminal requirements. The purpose of the track is as follows: tracks 1 and 1a are the transceiver and loading/unloading tracks, 2a track is the locomotive bypass track, the track 2 is also used for serving the vertical banks (3rd, 4th and 5th) and the track 3 is a loading/unloading track for containers.

In the extension of the track 1a, it is planned to build a Ro-La ramp for loading/unloading truck, i.e. for A technique transport. The ramp will be an iron construction, and behind it, a turnaround for trucks is planned. The track 3 is intended for continuous use by containers (15 wagons capacity), while assistant role is planned for the track 2a (9 wagons capacity). At the container terminal, an area for storing containers is planned, as they cannot be left at vertical banks. It is to be assumed that the containers, as well as the general cargo will be shipped from vertical banks using cranes on wheels, while the containers can also be serviced by vehicles. The compound of two bank railway track with industrial port track will be constructed in the area of quay no. 5. The purpose of the industrial road is to regulate road traffic in the area of the quay and to connect the quays to the existing County Road 4214. The plans for the industrial road also include the construction of the parking for trucks for the needs of Ro-La terminal, as well as the parking for the outgoing trucks with 20 lots and parking for incoming trucks with 20 lots. The construction will begin with preparatory work related to the construction site preparation, relating to the dismantling of the part of the coupling track, excavation, dismantling of the road crossing and cleaning of the construction site from other impurities. After the preparatory work, earthworks will be initiated. An integral part of the works are the works on the upper structure to be made of rails 49E1 on reinforced concrete board, with adequate fittings. This Activity will include the construction of storm water drainage and sanitary-faecal wastewater drainage systems. The purpose of the storm water drainage is to ensure controlled collection of all liquid that can be accumulated on impermeable surfaces of industrial port tracks and the roads along the quays of the Slavonski Brod port.

The storm water drainage system is a closed system that collects storm waters. The system consists of the drains, watertight pipes, manholes, and sedimentation tanks and separators of fats and oils, which are located at the end of the system. The storm water drainage system is not connected to the sanitary faecal waste water of facilities in the port area. Sanitary and faecal wastewater drainage system consists of two collectors (SF 1 and SF 2), which are connected to the sanitary faecal infrastructure system of the port of Slavonski Brod. The water supply system will be constructed. The total length of water supply extensions of the industrial port track and industrial port roads, with the associated infrastructure along the banks of the port of Slavonski Brod is approximately 450 m. It is planned to construct the pipeline water supply network using HDPE water supply pipes with DN 50 profile. The piping will be installed according to the rules set by pipes' manufacturers. To ensure the telecommunications needs of future users, it is envisioned to construct telecommunications distribution infrastructure (TDI). In the first phase, only TDI pipes will be installed, while the connection to the network is planned for the phase II, when terminal building would be built. The connection will be made to the planned TDI network of the port of Slavonski Brod. TDI allows for simple construction, maintenance and upgrade of telecommunication infrastructure, in accordance with the needs of future users and the technological development of the telecommunications sector. This activity contributes directly to the upgrade of port infrastructure and creating of preconditions for the provision of new and advanced services in the port.

Figure 70: Layout of the future intermodal facilitie in the Port of Slavonski Brod

(Source: Courtesy of the Port Authority of Slavonski Brod)

5.8 Port of Vukovar projects

5.8.1 Completed projects

No infrastructure projects were started or completed in the last 5 years in the Port of Vukovar.

5.8.2 On-going projects

There are no on-going infrastructure projects in the Port of Vukovar.

5.8.3 Planned projects

Currently, there is only one major infrastructure project planned in the Port of Vukovar, titled as the "Reconstruction of the Port of Vukovar - New port East". Unfortunately, the contract for the main design was suspended and no forecast of the continuation date of the project was available at the moment of writing of this report. Suspended contract was to encompass the development of the main design with the technical specifications, drawings and bill of quantities for reconstruction of the Port of Vukovar, based on the existing conceptual design and environmental, socioeconomic, geographical and geodetic surveys and to prepare and submit to the relevant national authority all required documentation according to national legislation necessary for obtaining the building permit, including all consequent modifications if necessary.

The new port of Vukovar project encompasses the construction of infrastructural port facilities, vertical bank, road and railway, communal infrastructure, port loading and unloading equipment as well as construction of administration building. Estimated amount of the cost for the main design was 1,6 million Euro, while the costs of the construction phase were estimated to reach a level of 24,17 million Euro.

5.9 Port of Novi Sad projects

5.9.1 Completed projects
There are no projects that are completed in the period 2012-2016

5.9.2 On-going projects
There are no on-going projects in the port of Novi Sad.

5.9.3 Planned projects
Currently, there are no planned projects in the port of Novi Sad.

5.10 Port of Belgrade projects

5.10.1 Completed projects
There are no projects that are completed in the period 2012-2016.

5.10.2 On-going projects
There are no on-going projects in the Port of Belgrade.

5.10.3 Planned projects
The fact that the city has expanded over time towards the port, and that the port is now in the urban environment, is the biggest obstacle for further development of the Belgrade port at the current location. According to the Spatial Plan of the Republic of Serbia for the period 2010 – 2020, gradual re-location of the port is planned. Ministry of construction, transport and infrastructure has made Decision on development of Spatial plan for special purpose area of the new port in Belgrade with a free zone, as well as Environmental Impact Assessment.

5.11 Port of Lom projects

5.11.1 Completed projects
Most important projects that are finished during the period 2012 – 2016 year cover all Bulgarian river ports with national importance, including the Port of Lom, are the following two projects:

Technical Assistance for waste management in Bulgarian public transport ports of national importance, 03/2013 – 12/2015
Objectives of the project were to identify needs of investments in reception and processing facilities for ship generated waste and to standardize procedures and reduce administrative burden and costs for documentation, control and monitoring of activities of waste management in the Bulgarian public transport ports.

Design and Implementation of Geographic Information System (GIS) for Port Infrastructure Management, 04/2011 – 12/2013
The project is financed by European Regional Development Fund and the national budget through the Operational Programme on Transport 2007–2013 under Priority Axis "Technical Assistance".

5.11.2 On-going projects

On-going projects also cover all river ports in Bulgaria. There are no specific projects for Port of Lom currently, except those being carried out under concession agreements.
Horizontal projects (for all river ports, including Lom) are the following:

Development of Port Community Systems, 01/2016 – 12/2019
The project involves Feasibility study and development of system along the two corridors, crossing the territory of Bulgaria (Rhine - Danube and Orient/East-Mediterranean), for management, optimization and automation of logistic processes and multimodal transport /Port Community Systems/.

Updating the Master Plans of Danube River ports, 01/2016 – 12/2018
The project includes updating the Master Plans for ports along the two corridors, crossing the territory of Bulgaria (Rhine - Danube and Orient/East-Mediterranean), including performance of environmental impact assessment and construction of waste reception facilities for solid and liquid waste.

Investments carried out through concession agreements are the following:

Concession of the terminal of Oryahovo, 06/2008 – 06/2033
Includes port road network repair, repair of the port fence, maintenance of the existing infrastructure.

Concession of the terminal of Lom, 05/2013 – 05/2048
The investments include rehabilitation of crane rails, rehabilitation of the power electrical network, building of a fence, rehabilitation of administrative and technical buildings and

facilities, repair and maintenance of machinery and equipment, new manoeuvring ship, video surveillance system, certification as per ISO 9001:2008 requirements, etc.

5.11.3 Planned projects

Bulgarian Ports Infrastructure Company planned the following projects for Port of Lom:

- Rehabilitation, reconstruction and modernization of the infrastructure and metal quay wall between 4-th and 6-th berth place; estimated costs: 2 million euro
- Rehabilitation, reconstruction and modernization of the western quay between 7 and 9 berth places; estimated costs: 2.5 million euro
- Rehabilitation, reconstruction and modernization of the eastern quay between 11 and 13 berth places; estimated costs: 5 million euro
- Building of new quay wall at the eastern quay, 14-th berth; estimated costs: 9 million euro
- Prevention of Lom city against floods – river levels above 815 cm cause serious damage and stopping of the work on the eastern quay of Port of Lom. Prevention is foreseen by raising the level of the terminal and total reconstruction of the port infrastructure. estimated costs: 1.1 million euro
- The master plan for development of the port includes building of an intermodal terminal and handling of ro-ro ships. Estimated costs are 6 million euro.

Planned projects do not have exact timing and are possible initiatives for funding under EU programmes.

5.12 Port of Ruse projects

5.12.1 Completed projects

Completed projects cover all river ports in the country, and respectively Port of Ruse is in that scope.

One of the completed projects that is not directly linked to the port, but concerns the activity of the port is the project:

Technical help for building of intermodal terminal in North-central region in Bulgaria – Ruse, 11/2012 – 01/2015

The total costs stated are 5.034.360 BGN or 2.574.027 euro. Results were: approved conceptual design, detailed development plan and procedures for preservation of the cultural heritage and environment. Currently the manager of the project – National Railway Infrastructure Company decided to stop this project.

5.12.2 On-going projects

Projects for development of the ports are connected also with the concession procedures. The Ministry of Transport, Information technologies and communication finished the procedures for concession of port terminals Somovit (2009), Svishtov (2007), Ferryboat terminal Nikopol (2013), Ruse-west (2013, but the contract was terminated in 2015).

Concession of the port terminal Svishtov, 04/2007 – 04/2038
The project involves Rehabilitation of storages, building of silos, repair of cranes, investment in machinery and equipment, administrative and technical buildings rehabilitation and maintenance, widening of berth 8, building of wastewater treatment facility, etc.

Concession of the port terminal Somovit, 08/2009 – 08/2031
The project includes rehabilitation and development of storage areas, new silos construction, maintenance and repair of the existing port infrastructure.

Concession of the port terminal Nikopol, 10/2013 – 10/2048
Project involves works on rehabilitation of the power electrical network, maintenance of the existing infrastructure.

Plans are developed for further concession of main port terminals with national importance – Ruse-east, Ruse-west. Concessionaires are responsible for reconstruction and rehabilitation, further investment and building of new facilities. As most of the terminals have old infrastructure and handling technologies, it is hard to achieve a development of high quality. Predominant investment is connected with partial improvement (repair) of the existing roads, railway lines, covered and open warehouses, etc. Port concessionaires in Svishtov and Somovit have built new storage facilities – silos for grain as this is one of the most important cargo types for them. The operator of Port terminal Ruse-east has developed new universal open and covered storages.

BPICo has finished projects funded by own meanings for rehabilitation of quay walls, storage facilities, repair of the internal railway infrastructure, etc. Analysis was made for development of new berths on the territory for future development of port terminal Ruse-east.

5.12.3 Planned projects

Strategic plans of the operator of Port of Ruse-east – the biggest river terminal in the country have changed according to the economic and market situation. Still, the plans for development of a specialised container terminal exist and seek sources for funding.

It is interesting that the initial design of Ruse-east port included building of three basins /now there is only one/. It seems that the development of the port through the years did not allow the use of its full potential due to periods of crisis.

Following projects are planned for Ruse, but at this moment neither the timing nor estimated costs are known:

Rehabilitation and maintenance of Port Ruse-east
Rehabilitation and maintenance of open and covered storage spaces, quay walls, water supply network, port railway network repair, port road network maintenance, etc.

Concession of Port terminal Ruse-east
Concession contract forsees maintenance, reconstruction and rehabilitation of the terminal, as well as new infrastructure if needed.

Development of specialised intermodal terminal in Port Ruse-east
Strategic plans of the operator include the option for development of specialised area in the port for handling intermodal cargo from/ to ships, railway and road. There is handling cargo in containers and trailers currently.

Rehabilitation and maintenance of Port Ruse-west
Project includes works on rehabilitation and maintenance of open and covered storage spaces, quay walls, water supply network, port railway network repair, port road network maintenance, etc.

Concession of Port terminal Ruse-west
Concession contract foresees maintenance, reconstruction and rehabilitation of the terminal, as well as new infrastructure if needed.

5.13 Port of Vidin projects

5.13.1 Completed projects

There are no completed projects in the Port of Vidin, other than those including all river ports, already described in the chapters related to the projects in the ports of Lom and Ruse.

5.13.2 On-going projects

Vidin-north and the Ferryboat complex Vidin are given for management to a private concessionaire in 2010. The company has developed three new berth places for bulk cargo. One new crane was put into exploitation there, and one auto weighing scale, increasing the handling capacity. New concrete pavements were made with area of 1200 sq.m.

Investment of the company for the first two years of concession amount to 7,5 mln BGN or 3,2 mln. euro.

Port terminal Vidin North, Ferryboat terminal Vidin, 10/2010 – 10/2040
Construction of three new berth places for bulk cargo. One new crane was put into exploitation there, and one auto weighing scale. New concrete pavements were made.

Apart from this project, there are two more on-going horizontal projects (all river ports), already described under chapters of on-going projects in the ports of Lom and Ruse.

5.13.3 Planned projects

Intermodal connectivity and development of container lines are among the priorities of port of Vidin. The concessionaire of Vidin – north and Ferryboat complex Vidin has declared its intention to build a new terminal for liquid fuels. The picture that follows represents visually the plans of the company for development:

Figure 71: Planned Intermodal terminal development and new terminal for liquid fuel on new berths

(Source: BPICO, via http://pan.bg/gallery/albums/userpics/10010/serv1.jpg accessed 2 August 2017)

There is potential possibility for building of additional berths in port of Vidin. Berths could be equipped with mobile or rail-mounted cranes for heavy cargo.

Planned projects of BPICo. include dredging works of the aquatory of Port of Vidin.

5.14 Port of Drobeta Turnu Severin projects

5.14.1 Completed projects

The only implemented project in the last 5 years in Port of Drobeta Turnu-Severin was *System for taking over and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu*, financed under POS-T programe. See project description at Port of Giurgiu in section 5.2.1.

Figure 72: Residues receiving system in Port of Drobeta Turnu-Severin

(Source: MPAC)

5.14.2 On-going projects

There are no on-going projects in Port of Drobeta Turnu-Severin.

5.14.3 Planned projects

Through the *D.A.N.U.B.E. Project - Danube access network - Releasing traffic in Europe by developing in Romania a high-quality TEN-T port infrastructure in optimal economic conditions* was elaborated a feasibility study including the following development in the Port of Drobeta Turnu-Severin:

In commercial port:

- New quay for container terminal 150 m in length and connection with the upstream silo quay

- Modernization on vertical quays 300 m (230 m in general and bulk cargo terminal and 70 m in oil terminal)
- New sloped quays 600m (500 m for waiting berths and 100 m for bunkering berth)

In passenger's port:
- Modernization of sloped quays 500 m (passenger's berths 400 m and multipurpose berth 100 m)
- Modernization of Gara Fluviala building and parking area
- Road suspended passageway at the entrance from the city and connection to existing road
- Lighting , water and sewerage networks

Project cargo ramp:
- Dredging 100 m
- Concrete platform 2700 m^2

Total estimated cost: 17,121,385 Euro (without VAT).

5.15 Port of Giurgiu projects

5.15.1 Completed projects

High Performance Green Port Giurgiu (2012 EU-18089-S), was the most important project completed in the Port of Giurgiu in the last 5 years.

Funded under 2012 TEN-T Multi Annual Programme and having as partners ILR Logistica Romania SRL, Industrie-Logistik-Linz GmbH, SC Administratia Zonei Libere Giurgiu SA, Giurgiu Municipality, the project was implemented during 07/2013-08/2015 and the main objective was to transform Giurgiu port into the first efficient green port on the Danube that plays the role of a leading high-performance tri-modal logistics hub in the area.

It was envisaged that this is to be achieved by relying on a dedicated energy-efficient and innovative port development concept and a series of environmental protection and restoration measures.

The project had 3 main actions:
- Analyse the situation in Giurgiu Port by elaborating a technical and operational analysis, a market analysis and an environmental analysis.
- Develop concepts for innovative technology at the port by undertaking a series of studies meant to lay out the steps needed to transform the current location into a highly performant green port.
- Design the new green port in Giurgiu and define its business plan.

Overall project budget was more than 800.000 Euro (50% EU contribution).

During 2012-2015 in the Port of was implemented the project *System for taking over and processing of residues from ships and for intervention in case of pollution on the Danube sector managed by CN APDF SA Giurgiu*, financed under POS-T programme.

The objective of the project was to increase the quality of services for the collection and processing of ship waste and pollution intervention by acquiring ships, installations and equipment, as well as for carrying out the infrastructure works necessary for taking / processing the residues from the river ships through the ports of Moldova Veche, Orsova, Drobeta Turnu-Severin, Giurgiu, Calarasi, Cernavoda being under CN APDF SA Giurgiu administration.

Within the project were purchased:

- 4 multipurpose collector vessels, having the ports of residence Cernavoda, Calarasi, Giurgiu and Drobeta Turnu Severin;
- 3 compact water treatment systems consisting of bilge and household wastewater treatment plants located in the ports of Cernavoda, Calarasi and Drobeta Turnu Severin;
- Containers for solid wastes in the ports of Cernavoda, Calarasi, Giurgiu, Drobeta Turnu Severin, Orsova, Moldova Veche;
- 3 access towers and 3 pontoons (including quay accessories) procured and assembled to be used for ships' boarding in the ports of Cernavoda, Calarasi and Drobeta Turnu Severin.

The project budget was 9,93 mil Euro.

Figure 73: Equipment used for the compact wastewater treatment plant (Giurgiu)

(Source: www.apdf.ro)

5.15.2 On-going projects

The project *High Performance Green Port Giurgiu – Stage II* is under implementation, being scheduled between 05/2015 – 08/2018 (Partners: ILR Logistica Romania SRL, SC Administratia Zonei Libere Giurgiu SA, Giurgiu Municipality). The overall budget is 15.594.063 Euro (85% EU contribution).

The general objective of the project includes:

- Improving the quality of the existing port infrastructure in Romania on the Rhine-Danube Corridor;
- Increasing the capacity by upgrading the port of Giurgiu's existing basic infrastructure and by procuring facilities for enhancing loading and transshipment at the port;
- Turning Giurgiu into the first "Green Danube Port" based on "Joint Statement on Guiding Principles for Development of Inland Navigation in the Danube River Basin";
- Supporting modal split by fostering the use of inland waterway transport and eliminating bottlenecks by building the missing links with rail/road/inland waterway networks.

The scope of the action is to:

- Construct the missing links with road, rail and inland waterway networks;
- Build a covered "all-weather" trimodal terminal;
- Develop and implement a supply chain system within the intermodal terminal;
- Upgrade the port water side basic infrastructure;
- Apply for obtaining the EMAS certification for the trimodal "all-weather" terminal.

5.15.3 Planned projects

The *project "Development of multimodal platform in Giurgiu port and hinterland connections"* is an idea to develop Giurgiu port as a multimodal platform to increasing port capacity and optimizing and streamlining freight, containers and people transport on the Danube. The project proposes the following works:

- New port basin (water surface) - area of 15.0 ha having 6 berths in the basin + RO-RO ramp + 3 berths (in the port basin: 3 berths container terminal, 3 berths -bulk cargo and grain terminal, at the Danube 3 berths - general cargo)
- Connection to utilities industry (electricity, water and sewage)
- Connection of the industrial sector to major transport networks
- Road connection - 5 km to west belt of Giurgiu
- Rail connection - 5 km to the rail belt of Giurgiu

- RO-LA boarding ramp of road vehicles on rail
- In order to achieve the project objectives: container terminal, general cargo terminal, cargo terminal and grain mass, ramp RO-LA, is necessary to obtain and purchase land area of 38.0 ha.
- Recalibration works of the manhole and adjacent piers in Veriga Basin and Plantelor Channel
- Ensure the operating depth at berths, by creating a dredging complex.

The project is intended to be submitted to the European Commission under the Connecting Europe Facility program. Estimated total value of the project: 103.532.000 euro.

5.16 Port of Galati projects

5.16.1 Completed projects

Following projects were completed in the recent period:

Strategic Development Programme of Galati Port

Objective: Analysis of the current situation and elaborating a Strategic Development Programme related to Galati Port in order to generally increase the attractiveness of the port area and the facilities offered to the customers.
Start date: 11.2014
End date (Estimation): 12.2015
Total Cost (Estimation): 0,29 MEUR
Funding: RO State budget & EU [Transport – Sectoral Operational Programme]

5.16.2 On-going projects

Following projects are currently active in the Port of Galati:

Infrastructure Works in Port of Galati: Modernisation of Berth 31 / Grain Terminal in Port of Galati - Pier 31

Objective: Up-grade (Modernization) of the Pier 31 infrastructure in order to increase the operational efficiency of the existing grain terminal.
Start date: 05.2011
End date (Estimation): 03.2018
Total Cost (Estimation): 9,28 MEUR
Funding: RO State budget.

Infrastructure Works in Port of Galati: Modernisation of Berth 32 / Grain Terminal in Port of Galati - Pier 32

Objective: Up-grade (Modernization) of the Pier 32 infrastructure in order to increase the operational efficiency of the existing grain terminal.
Start date: 01.2017
End date (Estimation): 12.2020
Total Cost (Estimation): 6,60 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

Galati Multimodal Platform / Stage I – Up-grade of the waterside infrastructure
Objective: Improve the port's road and inland waterway connections, up-grade the port basic infrastructure and provide new waterside terminal facilities.
It is part of a global project to develop and up-grade the overall Rhine – Danube corridor to reach stable navigation conditions throughout the year.
Activities covering:

- Preparatory studies
- Waterside infrastructure development, which includes an extension of the quay wall into the port basin
- Upgrading the port's connection to the road network.

Start date: 08.2016
End date (Estimation): 12.2020
Total Cost (Estimation): 25,62 MEUR
Funding: CEF Cohesion call – CNC

Reducing infrastructure clogging in the Maritime Danube Ports [Galati, Braila & Tulcea]
Objective: Analysis of the current situation related to the calming process within Maritime Danube Sector area and elaborating an Action Plan in order to decrease this process [including by port infrastructure works / investments] in order to offer better operating and sailing conditions for sea-going and inland vessels.
Start date: 01.2016
End date (Estimation): 12.2020
Total Cost (Estimation): 2,50 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

5.16.3 Planned projects
Following projects are planned in the Port of Galati:

RO-RO Terminal in Port of Galati
Objective: Up-grade the basic port infrastructure, construction of supporting facilities in the port and establishment of intermodal facilities
Start date: 01.2018

End date (Estimation): 12.2019
Total Cost (Estimation): 1,03 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

Galati Multimodal Platform / Stage II – Up-grade of the infrastructure for land access to the port of Galati
Objective: Modernization and rehabilitation works which shall be located in the South-East Region of Romania, New Basin area of the port of Galati, as follows:

- Upgrading the road access between the port and the TEN-T road network, including the construction of a bridge above the railway lines exiting the shunting yard and a roundabout
- Relocation of a railway line to enable free access from the shunting yard to the other port areas / port operators located downstream of New Basin port area

Start date: Tbd.
End date (Estimation): tbd.
Total Cost (Estimation): 10,00 MEUR
Funding: Tbd.

Galati Multimodal Platform / Stage III – Development of the multimodal platform for operations and In-Out Gate
Objective: Development of the multimodal platform for operations and In-Out Gate:

- Multimodal platform for operations
- Storage and stacking areas
- Internal roads
- Internal railway lines
- Fixed and mobile facilities for operations
- Terminal Operating System

Start date: Tbd.
End date (Estimation): tbd.
Total Cost (Estimation): 45,45 MEUR
Funding: Tbd.

5.17 Port of Braila projects

5.17.1 Completed projects
There was only one project completed in the Port of Braila in the period 2012-2016

Infrastructure Works in Port of Braila: Modernisation of Berths 23 – 25 (Partly)

Objective: Increasing the port operating capacity by building a new mooring / operating berth no. 23 in the upstream extension of the existing mooring / operating berth no. 24 and by arranging a waiting queue at berth no. 25 downstream.
Start date: 11.2010
End date (Estimation): 09.2013
Total Cost (Estimation): 9,66 MEUR
Funding: RO State budget & EU [Transport – Sectoral Operational Programme]

5.17.2 On-going projects

Following two projects are currently being implemented in the Port of Braila:

Reducing infrastructure clogging in the Maritime Danube Ports [Galati, Braila & Tulcea]
Objective: Analysis of the current situation related to the colmation process within Maritime Danube Sector area and elaborating an Action Plan in order to decrease this process [including by port infrastructure works / investments] in order to offer better operating and sailing conditions for sea-going and inland vessels.
Start date: 01.2016
End date (Estimation): 12.2020
Total Cost (Estimation): 2,50 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

Development of Braila Port
Objective: Analysis of the current situation and elaborating a Strategic Development Programme related to Braila Port in order to generally increase the attractiveness of the port area, to support further investments [including in infra- and super-structure] and to add more facilities offered to the customers.
Start date: 12.2016
End date (Estimation): 12.2020
Total Cost (Estimation): 0,72 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

5.17.3 Planned projects

No other infrastructure projects are at present planned to be executed in Port of Braila during the period 2018 – 2030, except for the project "Development of Braila Port", which is on-going, already started.

5.18 Port of Tulcea projects

5.18.1 Completed projects

No projects have been implemented between 2012-2016 in the Port of Tulcea.

5.18.2 On-going projects

There are currently two projects being implemented in the Port of Tulcea:

Reducing infrastructure clogging in the Maritime Danube Ports [Galati, Braila & Tulcea]
Objective: Analysis of the current situation related to the colmation process within Maritime Danube Sector area and elaborating an Action Plan in order to decrease this process [including by port infrastructure works / investments] in order to offer better operating and sailing conditions for sea-going and inland vessels.
Start date: 01.2016
End date (Estimation): 12.2020
Total Cost (Estimation): 2,50 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

Development of Tulcea Port (Stage I + Stage II)
Objective: Analysis of the current situation and elaborating a Strategic Development Programme related to Tulcea Port in order to generally increase the attractiveness of the port area and implementing further identified investments [including in infra- and super-structure], planned to add more facilities offered to the customers.
Start date: 12.2016
End date (Estimation): 12.2022
Total Cost (Estimation): 41,00 MEUR
Funding: RO State budget & EU [Large Infrastructure Operational Programme]

5.18.3 Planned projects

No other infrastructure projects are at present planned to be executed in Port of Tulcea during the period 2018 – 2030, excepting the project "Development of Tulcea Port (Stage 1 + Stage II), which is on-going, already started.

5.19 Port of Constanta projects

5.19.1 Completed projects

During the last years the Port of Constanta completed a number of infrastructure development projects amounting more than 210 mil EUR presented in below table. Please see the Annex III for details related to scope of work, type of infrastructure intervention, starting and ending date, as well as the total costs.

Table 15: Completed projects in the Port of Constanta 2012-2016

No.	Project name	Project description
1	Road bridge at km 0+540 of the Danube–Black Sea Canal and the works related to the road and access infrastructure for the Port of Constanţa	The works were related to the building of a bridge over the Danube–Black Sea Canal as well as to the various access roads, ramps and passageways related to the bridge. • Building of a bridge over the Danube–Black Sea Canal • Various access roads, ramps and passageways related to the bridge
2	Development of the railways capacity in the river-maritime area of the Port of Constanţa	The project aimed to build a complex railways system (railroad yard) in the river-maritime sector to supply optimal and uniform services for current and future port operators. The railroad yard station shall have 3 tracks for the reception of trains from the Romanian railways network, 12 tracks for the handling of carriages, their separation for the port operators and 2 tracks for the review and repair of the carriages
3	Completion of the North breakwater in the Port of Constanţa	The completion of the last 1,050 m long sector of the North breakwater, which has not been executed, will have positive effects in terms of safety operations in the Constanta Sea Port which is located on the Black Sea and connected to the Danube via the Danube-Black Sea Canal. • Decreasing the waves in the port to an acceptable level to ensure the safe operation of vessels; • Decreasing the destructive effects of the waves on the infrastructure within the port; • Smooth access of vessels to the entry into the port • Decreasing the sediments in the waters by guiding the currents further away.
4	Masterplan of the Port Constantza	The objective of this project was the carrying out of a medium and long term port strategic planning (until the year 2040) under the provision of a continuous port development and efficient use of the existing resources and infrastructure, directed towards the real needs of the market, deemed as being a priority for Constantza Port Administration. The new Master Plan will stand as the basis for the Port of Constantza development strategy within the period 2012-2040, as well as for the decisions regarding the optimum planning of investments in the port, in a global and harmonized vision to approach the port's projects and its development areas in such a way that the Port of Constantza should be able to equally serve the national needs and those of its

No.	Project name	Project description
		hinterland within the context of high efficiency, competition with other ports and globalization.

(Source: iC consulenten and MPAC)

5.19.2 On-going projects

In the present infrastructure development projects are under implementation as shown in the below table, having in total a budged over 100 mil Eur. Please see the Annex III for details related to scope of work, type of infrastructure intervention, starting and ending date, as well as the total costs.

Table 16: On-going projects in the Port of Constanta

No.	Project name	Project description
1	Modernisation of port infrastructure, by providing deeper approach channels and basins and by increasing the navigation safety in the port of Constantza (S1 Master Plan)	In order to ensure safe navigation conditions for ships in the port of Constantza, N.C. M.P.A. J.S.Co. Constantza has promoted an investment regarding: - Dredging works for the projected depth of port basins and channels in the port of Constantza; - Increasing the depth of the "work port" and its access fairway, located in the Constantza South Port; - Dredging at berths.
2	Implementation of Deep Water Specialized Berth (Berth 80) (S2 Master Plan	•Boost the competitiveness of the Port and increasing its capacity for dry bulk (grain) handling; •Establish the basis for increasing cargo flow and for developing the current position of Constanta Port as an export hub for cereals •Maximum utilization of existing port infrastructures •Avoid under-utilization of coal and ore terminal as a result of increasing ample capacities for this commodity in future
3	Expansion of road between Gates 7 and the junction with "Road bridge at km 0+540 of the Danube Black Sea Canal" [...] (S8 Master Plan)	The existing road connecting the Bypass of the Constanta city and the Gates no.7 and 9, has only two traffic lanes and has already reached its capacity limit. In addition, the road is in a poor technical condition, being insufficiently designed for heavy traffic from the Constanta North Port which runs mostly through Gate 7.

No.	Project name	Project description
4	Expansion to 4 lanes of the road between Gate no.10 bis and Gate no.10 (S10 Master Plan)	The main objective of the project is to ensure a continuous traffic flow of the four lanes road inside Constanta South Port after the access of the trucks through the new access Gate no.10 bis to the junction with the actual access point from the Gate no.10. Considering the fact that after the completion of the projects ”Bypass of the Constanta City” and “Road Bridge on Km 0+540 of Danube Black Sea Canal”, each of them having four road lanes up to the access point from Gate no. 10bis and starting from this point, the actual connection road to the Gate 10 has only 2 (two) lanes.
5	Upgrade of infrastructure and environmental protection of the Constanta port - PROTECT	The proposed Action entails upgrading basic port infrastructure, constructing a new on-shore waste collection facility, upgrading the signalling system in the port basin and the fairway, and purchasing five technical vessels. In addition, it foresees elaborating studies for: proper waste management in the oil terminal; generation and distribution of renewable energy in the port area and related public-private partnership potential; and evaluation of the port infrastructure's resilience to climate change. Training on waste handling, pollution and fire prevention is as well foreseen. The Action is embedded in the master plan for the port of Constanta, elaborated with EU funding, but not finalised yet.

(Source: iC consulenten and MPAC)

5.19.3 Planned projects

Two years ago the Masterplan of the Port Constantza[20] was prepared, including a medium and long term port strategic planning (until the year 2040) under the provision of a continuous port development and efficient use of the existing resources and infrastructure.

The Master plan defined a number of 20 short term development projects, 7 medium term development projects, 2 long term development projects.
After analysing reviewed data regarding the above mentioned projects they are included in

Please see Annex III for details related to scope of work, type of infrastructure intervention, starting and ending date, as well as the total costs.

[20] *Master Plan Port of Constanta,* Final report, December 2015 (updated to December 2016), Ernst & Young SRL - INROS LACKNER SE

Table 17: Planned project in the Port of Constanta (2018 – onward)

No.	Project name	Project description
1	RoRo and Car Terminal in Constanta South Port - Agigea (Pier IIIS) (S3)	The three stages will cover the following objectives: • Establishment of a competitive RoRo and Car Terminal in the Port • Provide the Port with modern infrastructures and facilities • Cover the additional car export cargo forecasted in short, medium and long term • Increase the possibility to attract new commodities (e.g. RoRo ferry traffic) • Establish the basis for additional traffic corridors to the Caucasian Region and Central Asia in a long term perspective (old silk road)
2	Implementation of Traffic Management System and Port Community System (S4)	The objectives of the traffic management system as part of a port operating system are: • Truck movements shall be pre-planned, coordinated and monitored among terminals; • Port passage procedures and traffic flow shall be improved; • Road congestion inside the Port and outside shall be minimized; • Receiving and holding capacity at the terminals corresponds with peak demand; • Savings in inland transport cost; • Safety, security and environmental quality standards shall be applied; The objective of the Port Community System is to unify and standardize the operational processes and administrative requirements of the port clients (freight forwarder, terminal and shipping operators)
3	Doubling the railway in the Agigea Lock - Constanta Ferry Boat [...] (S6)	The project will result in reduced waiting times of the trains. It is to be noted that the doubling of the access railway line at the Constanta Ferry-Boat station has been analysed within the Feasibility Study "Development of the railway capacity in Constanta South Agigea Port" (Object I.c.2"). However, in the above mentioned study the works were not included in Phase I of the works but being proposed to be implemented "as soon as all the financing conditions will be met".
4	Railway Development at Pier II (S7)	The project will lead to an increased efficiency of the loading-unloading operations and will ensure the absorption of the container traffic on railway lines which grew more than expected. According to the perspective traffic data three more loading-unloading rail lines are needed to be built.

No.	Project name	Project description
		Within the Feasibility Study "Development of rail capacity in Constanta Sud Agigea Port" development of the rail lines group of container terminal on Pier IIs was analyzed (Object II.B.1). In the above mentioned study the works were not included in Phase 1 of the project but completion being proposed to be implemented when necessary.
5	Truck Holding Area outside Constanta Port (S11)	After finishing of the road bridge over the Black Sea-Danube Channel almost all traffic approaches the port via the link to the Motorway A4 and considering the large plots of land available at the Motorway the truck holding area should be implemented at this location. The project provides the construction of a large sized truck holding area which will serve the entire Constanta Port (Old, New and South Port). The main objective of the project is to avoid the congestion at the gate areas and at terminal accesses by constructing of a truck holding area and implementation of a truck booking system (refer to Project S4) allowing for a scheduled arrival of the trucks at the terminals. All trucks entering the port have to stop and register at the truck holding area (pre-gate) and after receiving of customs and port control clearance they have to wait for the time window during which they are allowed to enter the port at a certain gate.
6	Overpass for new RoRo Terminal in Constanta South Port - Agigea (S12)	The main goal of the project is to connect the new Ro-Ro terminal with the port internal road network, thus avoiding traffic congestions.
7	New-Construction and Expansion of Electric, Gas and Heating Supply Networks (S13)	• Be in line with the green port strategies of the European Commission in all the issues regarding the utility networks. • To operate efficient utilities from the technical point of view but also from economic reasons
8	New-Construction and Expansion of Water Supply, Sewage and Drainage Networks (S14)	• Be in line with the green port strategies of the European Commission in all the issues regarding the utility networks. • To operate efficient utilities from the technical point of view but also from economic reasons • Improve the collection of the rainwater from the surrounding cliff and its soil stabilization
9	Development of Quay at the Entrance of the Danube-Black Sea Canal (near work port) (S15)	By creating new access to the Constanta South Port – Agigea through Gate 10a, in the proximity to berths DPL2 and DPL1, the development of new port areas, including new berths in this area might become attractive and might arouse interest of new investors in the development of new cargo handling activities close the entrance of the Danube-Black Sea channel.

No.	Project name	Project description
10	Development of Mooring quay adjacent to the connection canal between Berths no. 85-89 (S16)	• The target of the project is the increase of the cargo traffic in Constanta Port, by arranging an area located at the linking channel which is currently not developed • Enhance the safety through the linking channel • Attract new investors
11	Development of LNG Terminal in Constanta Port (S17)	• Establish the position of Constanta Port as hub for the LNG import/transit in the Black Sea region and for the landlocked Danube countries • Decrease the dependency of the national energy supply on Russian natural gas monopoly and transit problems (Ukraine) • Cover the LNG supply for the expected increase of LNG fuelled vessels • Boost the LNG fuel not only for shipping and transportation sector but also for other purposes as energy source for residential, commercial and industrial sectors
12	Road Bridge over the link canal and road network in Constanta South Port – River Maritime Area (S18)	The main objective of this project is the development of the port infrastructure works which will be concessioned to future port operators to perform superstructure works needed to carry out their own activities, leading to a maritime traffic increase. The area called "The Island" has a higher development potential, which should be turned to good account by carrying out works for infrastructure, main utilities networks and road and rail accesses. The achievement and exploitation of the infrastructure works are almost impossible without any direct road connection.
13	Repairing works in the northern and southern breakwater of Constanta Port (S19)	• Restore the breakwater and its cross section as close to its design condition in order to cope with future storm events • Secure the inner shelter waters in the Port of Constanta • Maintain the navigational safety conditions
14	Barge Terminal at Constanta South Port (2nd Stage) (M1)	• Expand the barge terminal to avoid existing congestion at the River-Maritime basin. • Cover the forecasted inland waterway traffic demand • Provide new fully dedicated facilities for pushers separated from the barge waiting terminal including respective back up areas
15	Container Terminal at the Island - 1st Stage (with EPZ) (M5-A)	Stage I • New Container Terminal could be operated by several operators sharing the facilities (including the relocation of the existing container terminal at Berths no. 51 and 52). • Increase the competitiveness between operators and end up with the monopoly in Container tariffs in the Port. • Ensure a modern infrastructure, establish the basis for increasing container traffic and attract new container lines. Stage II - III • Cover the forecasted demand in container traffic • Ensure a modern infrastructure in line with the 1st stage of

No.	Project name	Project description
		development and increase the capacity of the container terminal. • Guarantee the good position of the port in container traffic of the Black Sea region. Export Processing Zone • Improve the logistic activities within the Port boundaries • Initiates the export processing activities and developes new industrial activities inside the Port borders to strength the location of Constanta Port • Generate additional cargo and establish Constanta Port as industrial hub
16	Container Terminal on the artificial Island (without EPZ) (M5-L2-L3-B)	The project will comprise the following measures and works for each stage of development: • Land reclamation • New quay construction to enable a new berthing line for container vessels • Rail and road structures (Note: The access structures to the island, namely a new rail bridge and the already projected road bridge over the canal are not included in this project) • Engineering networks (electricity, storm water, potable water and sewage water) • Dredging activities • Embankment protection between development stages
17	LNG Bunkering Station at Berth no. 99 (M7)	• Cover the potential demand of the LNG as a clean and economical fuel for shipping • Boost LNG as transport fuel, especially for IWT, by means of providing the Port with modern bunker facilities close to the Black Sea – Danube Canal • Fulfil the clean fuel strategy of the EU Commission which requires the installation of LNG refuelling stations (fixed or mobile) in all 139 maritime and inland ports at the Trans European Core Network by 2020-2025
18	Deepening and Quay Strengthening at Berths no. 31-33 (M8)	Increasing the existing water depths in the whole terminal comprising the berthing line from Berth no. 31 up to no. 33 with a total length of 674 m in order to achieve the following objectives: • Improving the infrastructure to accommodate bigger vessels according to the bulk carriers shipping forecast (up to 80,000 dwt, Panamax sized vessel, partially loaded) • Boost the efficiency of the existing port infrastructure and maximize the utilization of the existing infrastructures • Establish the basis for increasing cargo flow and developing the current position of Constanta Port as a hub for the cereal exports
19	Development of Railway Capacity in the River-Maritime Area (Berths	Along with the development of the cargo handling and other port related activities in both the river-maritime sector and the area called “Island” the implementation of the Phase II of the works within the project “Development of the railway capacity in the

No.	Project name	Project description
	no. 86-103) - 2nd Stage (M9)	river-maritime sector of the Constanta Port (berths no. 86-103)" shall start.
20	Development of Rail Access to the Island (railway bridge in parallel with road bridge) (M11)	The objective of the project is to create a railway connection to the Island to enable the railway transport.
21	Railway Decommissioning Works in Constanta North - New Port (SM2)	Rededication of areas which are currently occupied by railway infrastructures
22	Railway Decommissioning Works in Constanta North - Old Port (SM3)	Rededication of areas which are currently occupied by railway infrastructures
23	Repair Works of Bridges and Overpasses in Constanta South Port - Agigea (SM4)	The main objective for the overpasses repair is to maintain them operational, in safety conditions. Carrying out the proposed repairs is beneficial on a short-term and delays in performing the works may result in increased degradations and consequently to an increased cost for the repair works.
24	Repair Works of Bridges and Overpasses in Constanta North - New Port (SM5)	The main objective of the proposal for the overpasses repair is to maintain them operational, in safety conditions. Carry out the propose repairs is beneficial on a short-term and delays in performing the works may result in increased degradations and consequently to an increased cost for the repair works.
25	Road repair works in Constanta North – New Port (SM6)	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.
26	Road repair works in Constanta South Port – River-maritime area (SM7)	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.
27	Road repair works in Constanta Old Port (SM8)	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.

No.	Project name	Project description
28	Railway infrastructure works in Constanta North – New Port (SM9)	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.
29	Railway Repair Works in Constanta North - Old Port (SM10)	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.
30	Railway infrastructure works in Constanta South Port- River-Maritime Zone (SM11)	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.
31	Railway infrastructure works in Constanta South Port - Agigea (SM12)	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.
32	Cereal Terminal on the artificial Island, (with EPZ) L4-A	Development of port teritory area • Building of a new quay • Dredging works • Dry bulk terminal specilized for cereals (operator's responsibility) • Rail and road connections • Utility networks
33	Cereal Terminal on the artificial Island, (without EPZ) L4-B	Development of port teritory area • Building of a new quay • Dredging works • Dry bulk terminal specilized for cereals (operator's responsibility) • Rail and road connections • Utility networks
34	Specialized vessels	Depollution, collector, PSI, dredging vessels
35	Development of Oil Products Platform on	Processing and storage area: Surface on the island - 22,38 Ha Surface on the island - 5,88 Ha

No.	Project name	Project description
	the artificial Island in the Port of Constanta	Maritime Terminal: Surface of 6,50 Ha includes: - quay for loading/unloading liquid and general cargo - western berth (280 m lenght) specilized for oil tankers up to 40,000 dwt capacity - eastern berth (350 m lenght) specilized for oil tankers up to 80,000 dwt capacity - dredging will reach 16.00 m draft - reclaiming land from the sea will obtain a surface of 6.50 ha adjacent to the berthing quays
36	Photovoltaic park in the Port of Constanta	The project will be build in the landfill area and it will have 10 MW installed power generated from 33,000 photovoltaic panels.
37	Wind power park in the Port of Constanta	This project is oriecnted to research, promotion, development and use of new forms of renewable energy technologies retaining carbon dioxide emissions.
38	Feasibility study for railway infrastructure modernisation in Constanta Port	The proposed action contributes to the achievement of the objectives of the global project by preparing for implementation of an investment alternative aiming at improving the port's rail connection and the rail hinterland connection on the TEN-T corridor. The study has to determine the way in which the respective objectives of the global project can be met by the proposed action, in terms of: 1. Full electrification of the line tracks in 25 kV power system; 2. Ensuring interoperability of railway infrastructure through the implementation of technical specification for interoperability and, in particular, the following parameters defined in the TEN-T Regulation: - Axle load - 22.5 t.; - Loading gauge - C; - Length of station lines – min. 740 m; - Nominal track gauge for railway lines – 1,435 mm; - Implementation of ERTMS; - Improving facilities for people with reduced mobility. 3. Increase the design speed as much as feasible whilst ensuring the maximum speed of 100 km/h for freight trains.
39	Constanta Green Port	The proposed Action aims to improve the environmental profile of Constanta port by developing a comprehensive and state of the art Port Environmental Management System, while focusing on finding solutions to reduce external costs, prevent damages to health and pollution of air, water and soil. Setting up and executing training of all port employees and the stimulation of the know-how transfer will be encouraged both in-house for the port administration and also between the port administration and private port operators. A multi-annual action programme

No.	Project name	Project description
		consisting of prioritised measures for the defined areas of action will be elaborated.

(Source: iC consulenten and MPAC)

6 Port infrastructure gap analysis

6.1 Port of Enns

6.1.1 Infrastructure gaps

Storage capacity: figure is not available at the moment due to the mixture between private and public assets and investments (infrastructure and suprastructure).

TO DO for Daphne-project: build up the figure until end of 2018.

Overall statistics for the whole port area:

TO DO for Daphne project: a complete input-output statistic (with typical figures should be elaborated for future general rough calculations, presentations, statistics, …; but this needs the cooperation of all the main cargo players within the total port area; EHOÖ has got ideas and drafts for a set of layers with more or less anonymous figures an hope that the other players will cooperate that at the end of the project we can present global cargo statistics for the whole port area (including the industrial business park).

6.1.2 Links between missing infrastructure and industrial-economic development

Special administration process form transportation of wood between forestry areas and Enns in order to bring the freight from the road the water; necessary for the strong Upper Austrian wood processing industry in order to fulfil environmental and economic needs for the future.

Feasibility-study for a special part of the port (free space on quay 21); "Truck-Train-Ship-Handling station (TTS") especially for connection of Adria to the Danube (one of the nearest distances is Ennshafen port) and special transhipment station in case of problems with navigability of the Danube, especially upstream of Enns – very urgent, because Straubing-Vilshofen has no solution until 2030; so the rest of the Danube (downstream can work well in the future); this topic has to be crosschecked with container-cargo (backup, back-freight, …).

Feasibility and planning for rail connection improvement (the trimodal port Ennshafen has got very good infrastructure and enough space for growing; the port is dedicated as industrial space; in order to manage the needs in the future decades it is necessary to start strategic planning for the next level in railway connection to the port on the Upper Austrian side, which could be needed if the modular shift will go the actual way and temporary problems of IWW will happen due to weather conditions; in this case a backup-line for water and transport is necessary and will foster additional in/outbound capacity of the lines; additional the development of further connections to the hinterland (both closer hinterland and further hinterland has to be performed because of foreseen capacity problems and even pressure to reduce truck traffic for the future due to environmental reasons.

6.1.3 Special infrastructure for surface pavement or other eco-friendly development

Surface pavement & drainage and precipitation water pre-treatment: the port activities and industrial parts were started 40 years ago; due to the mixture between port and private area all the utilities concerning drainage are a combined system; the situation is not state of the art according to strict Austrian (and even German) laws and a lot of improvement projects are necessary by force of the authorities and due to economic reasons (general maintenance of the areas, sometimes divestment of old very huge dimension, bring to a modern standard for new shipment equipment, …).

TO DO for Daphne-project: elaboration of a masterplan and preparation of further stepwise realisation for surface pavement & drainage systems (debundling, divestments, separations, new strategic lines and cost estimations); the planning for good infrastructure development should be done within the project in order to perform a best practice standard for eco-friendly ports on the Danube ("Green deal for the Danube") that after/outside the project the respective investment projects could be started but in the way of a good environmental and economic friendly masterplan; this work and planning even contain the parts about precipitation water pre-treatment measures for the different port areas; some singular pre-treatment devices were built over the years a result in a lot of cost for the port infrastructure; the future parts have to be planned according to a masterplan respecting the total view to build up a best practice for the future for responsible care ports along the river Danube; a sustainable development is only possible if proactive planning is done an stepwise realisation in the next decade; otherwise problems may occur for port development in the future with severe impacts on general cargo situation on waterway

Special eco-friendly equipment: a lot of devices have been built in Enns due to special problems or authority papers and neighbourhood problems (e.g. installed oil barrier for a port basin; noise barrier along the railway line, etc.).

TO DO for Daphne-project: further investigation of eco-friendly equipment for the port infrastructure and suprastructure equipment (reducing diesel motor equipment, electric devices, …) and planning for modernization of general infrastructure equipment like camera system along the whole area in order to control the area, erection of special equipment for safety and security an roads and areas due to general development of situation in Europe (terror, ….), feasibility for special eco-labelling for ports, etc.

6.2 Port of Vienna

6.2.1 Infrastructure gaps

For the Port of Vienna, no infrastructure gaps are reported or identified, other than those tackled in the planned project described in Chapter 5.3.2 Planned projects.

6.2.2 Links between missing infrastructure and industrial-economic development

Infrastructure gaps which are covered in planned projects for the Port of Vienna (Chapter 5.3.2). The need for the extension of the container terminal in the Freudenau harbour of the Port of Vienna is linked to the industrial and economic development. Based on the CBA done for the terminal expansion the superior traffic forecast was based on the freight traffic model of the traffic forecast Austria 2025+*.

Based on this, a specific assessment of combined traffic and a thorough analysis of the combined transport development was carried out. Consequently, a forecast for the development scenarios of combined transport in Austria was deducted. The resulting forecast showed that the share of combined transport increases through transport services in the long-distance traffic of goods, whereas rail and especially domestic inland waterway transport are losing their shares.

Even stronger growth rates are forecasted for the seaport-hinterland traffic from all seaports serving Austria, which in turn is handled increasingly in combined transport. Strong growth rates for the combined traffic are expected till 2025.

No further details were available due to commercial reasons.

6.2.3 Special infrastructure for surface pavement or other eco-friendly development

No information available

6.3 Port of Bratislava

6.3.1 Infrastructure gaps

In port of Bratislava there is potential for developing of the project of Public terminal of intermodal transport in Bratislava.

The Public terminal of intermodal transport (**VTIP)** was project of the Railways of Slovak Republic. The project compiled the requisite documentation and developed the feasibility study for the terminal. The VTIP is located on the land of Public Ports, jsc (VPAS) adjacent to the Palenisko basin. All documentation for zoning decision was prepared to meet the Planning Authority requirements and standards. *The implementation of the project has been suspended due to state aid restrictions applying once public funds* (EU funds and the state budget) are allocated.

The objective of the project is the construction of technical infrastructure for intermodal transport, which will meet the parameters of the AGTC and the AGC agreement. The terminal is designed to facilitate transshipment between the three modes of transport – road, rail and water. It is also designed to provide for sufficient capacity between Asia and Europe (market potential estimated at 55.000 TEU per year), as well as for sufficient capacity required by the regional logistic chain (volume of the potential market about 270.000 TEU per year).

If the terminal is built to the project specification, it will be capable of delivering 105.000 TEU per year within a short time frame. Full performance will not be immediate but its capacity will grow over the years depending on the development of intermodal transport in Slovakia.

The VTIP is designed as one long terminal in total length of about 750 meters. It consists of the bimodal part (rail/road) in total length of 450 meters and trimodal part (rail/road/water) in total length of 300 meters. Both parts will be operated by two gantry rail cranes and one mobile handling device (MMP). The gantry rail crane in the trimodal part is able to handle 3 boats of "Danube Europe IIb" type with loaded containers in four rows.

The bimodal part of the terminal is also served by gantry crane covering 4 operating sidings and 8 rows of the IPU. Assuming top-level hourly output of 40 handling per crane, the estimated time for unloading a Danube-type IIb Europe ship is about 1.5 hour.

6.3.2 Links between missing infrastructure and industrial-economic development

VPAS (Public Ports j.s.c.) does not have any information about the planned industrial-economic development in the hinterland of port Bratislava. But in case of future industrial-economic development the above mentioned VTIP project could help with the transshipment of the goods in the port.

The VTIP project includes construction of the new buildings, introduction of the new technological part for the bimodal and trimodal part of the terminal. It also includes construction of the administrative building with special checkpoint area for entry and exit of the vehicles. It should be located in close proximity of the Repair hall for IPU. The project also focuses on the construction of the road infrastructure within the terminal area that will connect the transshipment part of the terminal with the storage capacities. The parking place for the staff should be ensured as well.

Based on the different functions of the rail tracks, the project documentation necessary for the terminal construction is divided as follows:

- UCS1 Reconstruction of connecting track to railway station BA UNS - RSR BA Palenisko - Reconstruction of the existing connecting rail
- UCS2, ŽST BA Palenisko- Reconstruction of existing sidings of the public port Bratislava
- UCS3, BA Palenisko railway station, terminal- Construction of a new trimodal terminal

6.3.3 Special infrastructure for surface pavement or other eco-friendly development

All the legal requirements for the special infrastructure and its ecological aspects are defined in the national law acts:

- Inland Navigation Act no. 338/2000
- The Water Act no. 364/2004
- The Environmental Impact Assessment Act no. 24/2006

- Construction Act no. 50/1976

6.4 Port of Komarno

6.4.1 Infrastructure gaps

Project **Industrial complex – Tabakova Street -** The complex is located within the urban area of Komarno in the southeastern part of the city near the confluence of the rivers Danube and Vah (an Inland waterway of international importance). The complex is adjacent to the public port of Komarno that is the second most important port in Slovakia located 100 km downstream of Bratislava. The river Danube at this location forms a natural border between Slovakia (left bank) and Hungary (right bank).

The complex has good connections to local and national transport infrastructure. The complex is directly accessible from the first-class road I64 on Tabakova Street. There is also the potential to build a new entrance to the complex from the bank of river Vah. The area is well connected by road to Bratislava (105 km), Nové Zámky (30 km) Dunajská Streda (50 km) andNitra (70 km). Hungary (3 km) can be easily reached from the complex. The proximity of the European road E58 (located 70km away) is an additional advantage.

The complex is also accessible to pedestrians with access to the center of Komárno via a 6-minute walk. The complex is located directly near the cycling route, an attractive alternative mode of transport for visitors and staff working in this area. The bus stop for public transport is also located in front of the complex.

Railway sidings are located in the complex, which could be connected to the main railway lines at Komarno and Komarom (Hungary) railway stations.

The area is not currently operated at full capacity, which provides an opportunity for additional utilization according to market needs. The part of the complex currently in operation, serves as a storage area for small vessels and an area for their repair. The complex consists of storage facilities and warehouses in good condition. A significant part of the storage facilities is built as separable halls, which can be dismantled and moved if necessary.
Due to the convenient location of the area and its proximity to Komárno city center and the river Vah, the complex is suitable for development of services for small vessels. The main function of the complex is dry boat storage, to allow for storage of vessels over the winter. The proposed area for dry boat storage is 4,430 square meters where around 950 vessels up to seven meters could be stored. Construction of the warehouse would allow for the stacking of vessels ensuring maximum utilization of the storage space.

The construction of a small gas station, including a car wash facility, is planned. It will be used for both cars and vessels, if needed by the visitors or owners of small vessels. Existing technical equipment in one of the buildings allows for its use as a future vessel service station. Complementary to the dry boat storage, it is planned that shops and basic services for the vessel´s owners will be provided.

In the complex, additional storage space, small shops, halls for small industry production and administrative spaces are also planned. All of them may be further expanded if necessary. The complex is well-connected to the mains electrical system with sufficient capacity available.

6.4.2 Links between missing infrastructure and industrial-economic development

VPAS (Public Ports j.s.c.) does not have any information about the planned industrial-economic development in the hinterland of port Komarno.

In case of potential industrial-economic development in the hinterland of port Komarno the project idea of Industrial complex-Tabakova street will help with the storage capacity and small gas station.

6.4.3 Special infrastructure for surface pavement or other eco-friendly development

All the legal requirements for the special infrastructure and its ecological aspects are defined in the national law acts:

- Inland Navigation Act no. 338/2000
- The Water Act no. 364/2004
- The Environmental Impact Assessment Act no. 24/2006
- Construction Act no. 50/1976

6.5 Port of Komarom

6.5.1 Infrastructure gaps

It is necessary to have immobile silos in the port area for bulk cargo, not only a mobile one. Putting an immobile bridge weigh in a place of the current mobile one would also contribute to the modernization of the port. The installation of tri-modal storage capacities and construction works for lengthening the currently too short railway lines within the port area would be still a fundamental but a higher volume development.

6.5.2 Links between missing infrastructure and industrial-economic development

It is a huge disadvantage in the port area, that there are no fixed, immobile silos and flat storage. The above mentioned international corporate, Group Vandamme would prefer as big silos as possible in the port area to load and unload vessels transporting cereals easier and in a more comfortable and reliable way.

Besides, so far, only one-way loading is possible from road indirectly into vessels. Rail tracks are more difficult to load and unload in the port area since cranes could not manage it, only by putting cargo down to surface, and then to the other vehicle/mode of transportation. This is an old, outdated and extremely slow technology that does not attract more companies to come and use the port and its services.

A modern and one by one growing chain of silos also could be installed on the shore-side including equipment with capacities of 100, 500 and 1000 tons. Silos could even be connected either on the bottom or on top of them or both. To make loading railway tracks easier, gullet technology shall be introduced.

Due to missing elements of the infrastructure, economic actors located in between Győr-Gönyű and Komarom ports are and will in the future be choosing Győr-Gönyű port's services, since it is a very modern port having the newest technology and huge capacities. Komarom cannot, at least does not want to compete with it. The aim is to serve smaller and middle size and demands related to typical bulk cargo by improving the current infrastructure and equipment and exploiting all the potential of the port physical opportunities.

6.5.3 Special infrastructure for surface pavement or other eco-friendly development

As it does not differ per regions or counties in Hungary, there is the same legal background for Port of Komarom and of Budapest. Legal background of environment related infrastructure development in Hungary is based on Government Decree 314/2005. The activities listed in Annex 1 of the Decree, in this case: 39. Ports (except for the drift and mooring pontoon) are required to obtain an environmental permit, called the Environmental Impact Assessment (EIA) procedure.

If an activity is not listed in Annex 1 of the aforementioned Decree, a prior examination in Annex 3 of the same Decree shall be carried out. This is a shorter and simpler process than the EIA. Its purpose is to state whether a significant environmental impact can be assumed and whether the EIA is necessary. If the finding states it cannot be assumed, there is no need to have separate environmental permit before the building permit. In case of having a presumption, a separate environmental permit is required. There are already more issues in Annex 3 for a port, but there may be concerns about coastal infrastructure. (Annex 3: pp 86-90, 93).

If the planned activity is not included in either Annex 1 or Annex 3, it is still necessary to consider whether Natura 2000 is affected. If it is affected by Regulation (EC) No. 275/2004 of the European Communities for Nature Conservation Areas of significant importance. (X. 8.) Governmental Decree documentation should be prepared, evaluated by the competent nation park. (If there is an activity under 314/2005 Annexes 1 and 3 and involves Natura 2000, then this assessment of the impact must be made within that framework.)

Transboundary impacts (Espoo Convention) shall be considered as well, as it has been integrated to the Hungarian law in 132/2010 (IV. 21.) On the Proclamation of Espoo, 26 February 1991, on the Strategic Environmental Assessment in Kyiv, adopted on 21 May 2003. However, this shall be considered having regard to procedures of 314/2005.

6.6 Port of Budapest

6.6.1 Infrastructure gaps

As mentioned in Chapter 5.6, missing infrastructural elements at the Freeport of Budapest are those 22 incomplete pieces of projects that would contribute to increase the level of assessments, provided services and convenience of both every day and long-term working life at the harbour. As listed above, these are mostly related to mobility and transportation, the accessibility of the port: railways, roads and parking places; as well as modernization of security system both physical and IT.

6.6.2 Links between missing infrastructure and industrial-economic development

While missing infrastructural elements quoted above were in the Freeport, there are plenty of gaps around the area of the port. First and foremost, an issue affecting all other IWW related projects is the navigability of the River Danube. Until the depth of 2,5 metres is not dredged all along the river, the water way accessibility and cargo traffic (i.e. long-term sustainable development) of the port could not improve considerably.

Secondly, construction works of ring road M0 and motorways around the capital must be completed as soon as possible to increase the accessibility and effectiveness of transportation in the Region of Central-Hungary. Besides, the mobile flood dam will also contribute to ensure flood – and this way – product protection in the port by realizing the investment.

When these developments are implemented, that 22 yet not completed pieces of projects will become more urgent.

Mirroring the question, namely, what if a plant was closing in the area of the Freeport of Budapest, or any infrastructural deterioration was happening, or a company was leaving the Freeport. Firstly, any market player or productive investment could be substituted by searching for another economic actor who will implement the given development and then provide certain services. Having no longer a productive activity in the Freeport although makes no benefit, but at least does not cause deficit either. Meanwhile, however, in the era of EU cofounded projects, it is a little bit easier applying for and managing infrastructural investments, without that, it would be expensive and never returning. It means, it is difficult to find and agree with any investor who can afford completing a brownfield development.

6.6.3 Special infrastructure for surface pavement or other eco-friendly development

Legal background of environment related infrastructure development in Hungary is based on Government Decree 314/2005. The activities listed in Annex 1 of this Decree, in this case: 39. Ports (except for the drift and mooring pontoon) are required to obtain an environmental permit, called the Environmental Impact Assessment (EIA) procedure.

If an activity is not listed in Annex 1 of the aforementioned Decree, a prior examination in Annex 3 shall be carried out. This is a shorter and simpler process than the EIA. Its purpose is to state whether a significant environmental impact can be assumed and whether the EIA is necessary. If the finding states it cannot be assumed, there is no need to have separate environmental permit before the building permit. In case of having a presumption, a separate environmental permit is required. There are already more issues in Annex 3 for a port, but there may be concerns about coastal infrastructure. (Annex 3: pp 86-90, 93)

If the planned activity is not included in either Annex 1 or Annex 3, it is still necessary to consider whether Natura 2000 is affected. If it is affected by Regulation (EC) No. 275/2004 of the European Communities for Nature Conservation Areas of significant importance. (X. 8.) Governmental Decree documentation should be prepared, evaluated by the competent nation park. (If there is an activity under 314/2005 Annexes 1 and 3 and involves Natura 2000, then this assessment of the impact must be made within that framework.).

Transboundary impacts (Espoo Convention) shall be considered as well, as it has been integrated to the Hungarian law in 132/2010 (IV. 21.) On the Proclamation of Espoo, 26 February 1991, on the Strategic Environmental Assessment in Kyiv, adopted on 21 May 2003. However, this shall be considered having regard to procedures of 314/2005.

6.7 Port of Slavonski Brod

6.7.1 Infrastructure gaps

No major missing projects or infrastructure items were reported or identified in the Port of Slavonski Brod. The Port Authority of Slavonski Brod follows well justified market research and does its best to, on the one hand, meet the market demands and on the other hand, to provide infrastructure “incentives” to the nearby industries to use the port and inland waterway transport as their preferred mode for their supply chains.

Although not directly related to the throughput of the current and future cargoes, the only issue that might be considered is the provision of shore-side power supply for vessels, which is not a complex and costly undertaking, especially when the most of the port facilities are still under construction. Depending on the technological development in inland waterway fleet, an LNG bunkering supply facility for vessels could be a long-term plan.

6.7.2 Links between missing infrastructure and industrial-economic development

Currently missing infrastructure in the Port of Slavonski Brod is related to the infrastructure facilities which will be built within the project “Infrastructure upgrading and development of terminals and supporting facilities in port of Slavonski Brod”. Vertical quays and the necessary facilities for the Ro-La terminal, along with the rail tracks and internal roads are built on the basis of the industrial development in the hinterland and the relevant cargo forecasts.

The port Authority also received LOI from Optima group, registered for production of oil and oil derives, interested for storage and transport of crude oil and derives information obtained from the Port Authority of Slavonski Brod related to inputs/outputs of specified facilities.

Based on the planned capacity of bioethanol production from 200,000 t/year, the total annual transhipment in the port area of Slavonski Brod is planned as follows:

- Supply of raw materials - production corn about 600,000 tonnes/year,
- Delivery of the various production components about 50,000 tonnes/year,
- Delivery of liquid bioethanol around 200,000 t/year,
- Delivery of DDGS (the leftovers from grinding and production) around 204.000 t/year. The term for the realization of the construction of the bio-ethanol plant is end of 2019/ beginning of 2020.

This investment is realistically to be expected, since the subject company already signed a long-term concession contract for lease of land in the zone. Of the total potential of approx. 1 million tons of various cargo per year, we used 50% of this quantity for a realistic scenario in the first year of operation (2020), i.e. 0,5 million tons of various freight during one year.

Other operators plan to annually transport of up to 2 million tons of oil and up to 3 million tonnes of cereals, sugar and bio fuels, and products of metal industry and other goods. Other justifications for the construction of the missing and planned infrastructure, linking the industrial development with the port development, is give in Chapters 4.7.8 and 4.7.9.

6.7.3 Special infrastructure for surface pavement or other eco-friendly development

Information not available.

6.8 Port of Vukovar

6.8.1 Infrastructure gaps

Based on the only port development study at the moment of writing of this report, the Port of Vukovar plans to fill in the infrastructure gaps in two phases, namely “New port East” (phase 1) and “New port West” (phase 2). The study identified the following gaps in the port’s infrastructure in phase 1:

- Bulk Terminal
- Gravel separation & concrete batching plant

- Bag storage building
- Sand terminal
- Ship service terminal
- Fuel and oil terminal
- Port administration area
- Customs building
- Road maintenance yard
- Grain and oil seed terminal

In phase 2, following infrastructure gaps are planned to be tackled:

- General cargo terminal
- Weather protected material handling
- Container terminal
- Combined traffic terminal
- Fertilizer terminal
- Logistic service centre
- Ro-Ro ramp

6.8.2 Links between missing infrastructure and industrial-economic development

Ambitious plans for the development of the port of Vukovar infrastructure are based on the realistic demand and on the facilitation initiatives for the potential future cargo and its attraction to the port. For example, the ship service terminal is based on the activities of the company DDSG d.o.o., fuel and oil terminal is based on the activities and plans of the company EuropaMil, fertilizer terminal is linked to the activities of Petrokemija, while the bulk terminal is linked to the activities of the company Promil Plovidba.

6.8.3 Special infrastructure for surface pavement or other eco-friendly development

No information available.

6.9 Port of Novi Sad

6.9.1 Infrastructure gaps

The identified bottlenecks occur due to low productivity of the cranes on the sloping quay during low water-level periods. Extension of the operating vertical quay to the total quay length (800m) would be one of the priorities in order to achieve higher level of productivity. At the moment, length of vertical quay is approximately 170m.

The private siding and the road network within the port area should be redesigned.

6.9.2 Links between missing infrastructure and industrial-economic development

Most of loading/unloading operations in the port are seasonal. Occasionally, even the 24/7 operations are not enough to serve all the needs of the customers. Beside the extension of the vertical quay, a larger capacity system for handling grains, fertilizer components and fertilizers should be considered, as well as construction of grain silo of at least 20.000t. There is a silo of 65.000t capacity in the immediate vicinity of port, with the direct access to the operational quay. It is integral part of the grist mill and periodically is used for storing the goods in export. Modernisation of this silo loading equipment is also planned.

In order to develop multimodal terminal acquisition of new higher-capacity cranes and equipment is necessary. Currently, container operations are limited with the crane lifting capacity of 27t. Storage facilities should be also expanded and additional logistic services developed.

6.9.3 Special infrastructure for surface pavement or other eco-friendly development

No environmental rules regarding the surface pavement and precipitation water pre-treatment are currently applied in the construction of the new infrastructure and rehabilitation of the existing port infrastructure. Such measures should have a legal base and later be implemented for rain water pre-treatment regulations for construction and rehabilitation of port infrastructure.

6.10 Port of Belgrade

6.10.1 Infrastructure gaps

Considering the fact that the port is “surrounded” with the urban environment, access roads are main limitation factor for the port development at the current location. Railway tracks accessing the port area are crossing the city centre and will be terminated in next few years. Even the large storage capacities located in the city centre and suitable for city logistics are not attractive any more. Most logistic companies and retailers build own modern warehouses beside the newly build ring road.

Having in mind decreasing trend in loading/unloading operations of the port, existing infrastructure is sufficient to serve the needs of existing and some potential customers. Cranes and equipment are aged and with low productivity, but fulfilling basic needs. Port operator is not interested to invest in equipment due to the above mention limitations and low interest in port services on current location.

6.10.2 Links between missing infrastructure and industrial-economic development

Development orientation of Belgrade is based on the improvement and construction of new transport infrastructure, including also new concept of Belgrade railway junction, arterial tangent and ring road, as well as construction of new multimodal transport distributive centre. That imposes the necessity to develop new solutions for the system of transport infrastructure, especially those eliminating railway cargo transport from the centre of the city and including new location for the port in Belgrade. The construction of new cargo port with container terminal in Belgrade would enable more efficient flow and safety of cargo transport through Belgrade, and reduce pollution and noise.

Further to the results of Transport Study, the design envisages port for trans-shipment of solid and liquid cargo, or oil derivatives (mineral oils and fuels) and biodiesel. Bearing in mind the EU directives for trans-shipment of mineral oil and its products on rivers and channels, the proposed solution envisages two port basins – for solid and liquid cargo.

Container terminal for all modes of transport, as an integral part of the port, is envisaged in the riparian part of the port, out of the port basin. This was influenced by demands for quick and efficient transport of containers from water to land and vice versa, and consequently the operative bank of Container Terminal is envisaged on the Danube bank.

Ro-Ro ramp is also considered as part of the infrastructure of the future port.

6.10.3 Special infrastructure for surface pavement or other eco-friendly development

No environmental rules regarding the surface pavement and precipitation water pre-treatment are currently applied in the construction of the new infrastructure and rehabilitation of the existing port infrastructure. Such measures should have a legal base and later be implemented for rain water pre-treatment regulations for construction and rehabilitation of port infrastructure.

6.11 Port of Lom

6.11.1 Infrastructure gaps

Based on the infrastructure assets available in Port of Lom, the following gaps may be identified:

- Missing intermodal facilities – specialised berths, storages, equipment and technique.
- No oil, chemical or gas terminals in Port of Lom – building of such facilities requires long-term planning and essential investment;

- No ro-ro terminals in the area of Port of Lom – there were some plans in the past for building a ro-ro terminal to serve a connection between Lom and the Romanian village Rastu. This project did not find enough support to be developed and implemented;
- No capacity for heavy lift and out-of-gauge cargo – this port has no ability to handle heavy cargo units. Plans of the concessionaire include buying of a mobile crane and establishment of suitable berth in the future.
- No waste reception facilities as per the requirements of the Bulgarian and European legislation
- No special eco-friendly equipment

Except the gaps described above, we may take into consideration the bad condition of the existing infrastructure. Most of the Bulgarian ports are built in the beginning of the last century and the predominant infrastructure and handling equipment is physically outdated. Modernization of the entire port area and all the technical facilities for handling is very expensive and made partially when possible.

The bad condition and the low transport speed of roads and railways linking ports with the hinterland adds more negative impact on ports activity.

A National Master Plan for Danube ports is required which could provide more direction into the future of Danube Ports.

6.11.2 Links between missing infrastructure and industrial-economic development

These aspects are described in the previous chapter based on the scarce availability of necessary information.

6.11.3 Special infrastructure for surface pavement or other eco-friendly development

Currently there are no plans for establishment of special infrastructure for surface pavement or eco-friendly development. This could be identified as one of the gaps for Port of Lom. In addition, it could be pointed out that all contemporary modernisation and rehabilitation is made strictly with keeping the current legislative obligation regarding the ecology and environment.

6.12 Port of Ruse

6.12.1 Infrastructure gaps

Similar to the port of Lom infrastructure gaps, Ruse also disposes of old assets and handling facilities. The big territory of most of the terminals in Ruse port require bigger amount of investment in:

- Modern infrastructure;

- New handling equipment and technique;
- Specialised container or intermodal terminal connected with good-quality road and railway lines;
- Specialised terminals for foods, dangerous cargo, grain;
- Waste reception facilities, etc.

There are LNG and fuel terminals in Ruse area, and the need for building new terminals of this type is not urgent.

6.12.2 Links between missing infrastructure and industrial-economic development

The most negative impact on this port is the long transport times that it could offer for the river transported goods. That is why the predominant transport mode used by the companies in the hinterland is the automobile. Modern companies prefer reliable transport routes, and the Danube river in the Bulgarian – Romania section cannot respond to clients' requirements.

6.12.3 Special infrastructure for surface pavement or other eco-friendly development

There are no publicly known plans for establishment of special infrastructure for surface pavement or eco-friendly development. This could be identified as one of the gaps for Port of Ruse also. In addition, it could be pointed out that all contemporary modernisation and rehabilitation is made strictly with keeping the current legislative obligation regarding the ecology and environment.

6.13 Port of Vidin

6.13.1 Infrastructure gaps

Port of Vidin gaps are connected with the old infrastructure, bad road and railway connections. The good geographical location of the port does not bring essential profits for its activity.

6.13.2 Links between missing infrastructure and industrial-economic development

As stated in this analysis, the hinterland of this port has low economical parameters compared to other Bulgarian regions and in Europe as a whole. Much can be done for improvement of the transport infrastructure, together with rehabilitation and modernization of the port. Economic development could be achieved by assuring preferences for investors and for the population of the region.

6.13.3 Special infrastructure for surface pavement or other eco-friendly development

There are no plans for establishment of special infrastructure for surface pavement or eco-friendly development. This could be identified as one of the gaps for Port of Vidin. In addition, it could be pointed out that all contemporary modernisation and rehabilitation is made strictly with keeping the current legislative obligation regarding the ecology and environment.

6.14 Port of Drobeta Turnu Severin

6.14.1 Infrastructure gaps

The bulk cargo terminal in Drobeta Turnu Severin has a high degree of utilization and is predicted to be over-used in the future.

The port has no dedicated infrastructure for containers operation that make this operation inefficient.

Port of Drobeta Turnu Severin has warehouses and storage facilities that are not appropriate to modern logistics practices. That is why the building of a new trimodal terminal is needed[21].

6.14.2 Links between missing infrastructure and industrial-economic development

The actual most important infrastructure missing link is the road connection with the national network. Currently the road to access the port is in very bad condition, making almost impossible to have an effective connection with port.

6.14.3 Special infrastructure for surface pavement or other eco-friendly development

The Romanian legal framework regarding the environment protection during the building and use of port infrastructure includes:

- *Law of piers safety no. 259/2010*
- *Methodology for assessment of safety status in exploitation of dams and piers used for industrial waste deposits - NTLH - 023*, approved by the Joint Order of the Minister of Waters and Environmental Protection no. 116 of 11.02.2002 and of the Minister of Public Works, Transport and Housing no. 289 of 06.03.2002.
- *The Regulation on the management of emergency situations caused by floods, dangerous meteorological phenomena, hydrotechnical accident and accidental pollution*, approved by Environmental Ministry Order no. 420/11.05.2006.

6.15 Port of Giurgiu

6.15.1 Infrastructure gaps

The port has a well-used general cargo terminal for which the forecast shows an over-use until 2030. Giurgiu port has both bulk cargo, general cargo and cereals handling facilities, but this port does not have dedicated facilities for container operation[22].

[21] General Master Plan of Transport in Romania- Revised final version of the Report on the Master, Short and Medium Term Plan, Ministry of Transport, September 2014 (in Romanian language)

[22] Same as above

The Port of Giurgiu is affected like the other Romanian inland water ports by important infrastructure gaps. They have been identified in Panteia & PwC's study[23], based on the complaints received from shipping lines and port users:

- *Insufficient water level*
- *Lack of quay space, resulting in vessels having to wait for a berth*
- *Lack of storage space behind the quay, often caused by the "city centre" locations of older ports Insufficient (or outdated) mechanical equipment*
- *Poor interface arrangements for rail and inland waterway transport.*

6.15.2 Links between missing infrastructure and industrial-economic development

Due to its location near the land border and its proximity to Bucharest this port is an important hub for future freight transport on the Danube.

A new trimodal terminal in Giurgiu would increase its capacity to operate containers. This type of development will include lines of sufficient capacity, links efficient road and secure access to the port.

6.15.3 Special infrastructure for surface pavement or other eco-friendly development

According to Environmental Ministry Orders no.1798 /2007 and no.1298/2011 the development of port infrastructure (NACE code 4524) may be approved only after obtaining the Environment authorization.

The reader is referred to the Romanian legal framework regarding the environment protection during the building and use of port infrastructure in section 6.1.3.

6.16 Port of Galati

6.16.1 Infrastructure gaps

The National Company – Maritime Danube Ports Administration SA Galati achieved during the period 2014 – 2015 the project: "*Strategic Development Programme of Galati Port*".

By this project, the infrastructure gaps for the Port of Galati have been analysed and reported within the final deliverable of the project, namely: Strategic Development Programme for Galati Port[24].

---

[23] Quoted by *Report on the potential of the port and its capacity for the future,* 212-EU-18089-S –"High Performance Green Port Giurgiu" Project, Version 0.1 Final, 23rd February 2015

[24] http://www.romanian-ports.ro/PSDPG/comunicate_presa/150605_Plan%20Strategic%20PSDPG_final.pdf

As well, an Action Plan have been prepared.[25]

Based on these 2 deliverables, CN APDM SA Galati prepared the infrastructure investment projects portfolio for the next budgeting period (2014 – 2020) in accordance with the Transport General Master Plan of Romania, elaborated by the Romanian Ministry of Transport.

6.16.2 Links between missing infrastructure and industrial-economic development

Within the project: *"Strategic Development Programme of Galati Port"* the future industrial-economic development of Galati area has been considered and the projects portfolio prepared in order to cover the infrastructure gaps / missing links for the Port of Galati took in account the development estimations.

6.16.3 Special infrastructure for surface pavement or other eco-friendly development

All legal requirements for infrastructure and superstructure construction works are established in the national laws, as follows:

- Law No. 50/1991 regarding the authorization of the execution of the construction works
- Law No. 17/1990 on the legal status of inland waters, territorial sea, contiguous areas and exclusive economic zone of Romania
- Water Law No. 107/1996
- Government Emergency Ordinance No. 195/2005 regarding the environment protection
- Government Ordinance No. 22/1999 on the administration of the ports and waterways, the use of the public transport infrastructure of the public domain, as well as the carrying out of the activities of water transport in ports and inland waterways.

The beneficiaries of the construction works have the obligation to obtain all legally required permits, approvals, authorisations, etc. in accordance with the Romanian legal provisions in force.

The Technical Projects, which are the basis for obtaining specific construction approvals and authorisations, are obliged to respect all technical standards related to the construction category to which they refer.

[25] http://www.romanian-ports.ro/PSDPG/comunicate_presa/Plan%20Actiune%20PSDPG%20vers.%20preliminara%2026.06.2015.pdf

6.17 Port of Braila

6.17.1 Infrastructure gaps

The National Company – Maritime Danube Ports Administration SA Galati started in 2016 the project: "*Development of Braila Port*".

By this project, the infrastructure gaps for the Port of Braila will be analysed and reported within the final deliverable of the project, namely: *Strategic Development Programme for Braila Port*.

As well, an Action Plan will be prepared. At present, the project is on-going, in progress.

Based on these 2 deliverables, CN APDM SA Galati will prepare the infrastructure investment projects portfolio for the next budgeting period (2014 – 2020) in accordance with the Transport General Master Plan of Romania, elaborated by the Romanian Ministry of Transport.

6.17.2 Links between missing infrastructure and industrial-economic development

Within the project: "Development of Braila Port" the future industrial-economic development of Braila area has been considered and the projects portfolio prepared in order to cover the infrastructure gaps / missing links for the Port of Braila took in account the development estimations.

6.17.3 Special infrastructure for surface pavement or other eco-friendly development

All legal requirements for infrastructure and superstructure construction works are established in the national laws, as follows:

- Law No. 50/1991 regarding the authorization of the execution of the construction works
- Law No. 17/1990 on the legal status of inland waters, territorial sea, contiguous areas and exclusive economic zone of Romania
- Water Law No. 107/1996
- Government Emergency Ordinance No. 195/2005 regarding the environment protection
- Government Ordinance No. 22/1999 on the administration of the ports and waterways, the use of the public transport infrastructure of the public domain, as well as the carrying out of the activities of water transport in ports and inland waterways.

The beneficiaries of the construction works have the obligation to obtain all legally required permits, approvals, authorisations, etc. in accordance with the Romanian legal provisions in force.

The Technical Projects, which are the basis for obtaining specific construction approvals and authorisations, are obliged to respect all technical standards related to the construction category to which they refer.

6.18 Port of Tulcea

6.18.1 Infrastructure gaps

The National Company – Maritime Danube Ports Administration SA Galati started in 2016 the project*: "Development of Tulcea Port".*

By this project, the infrastructure gaps for the Port of Braila will be analysed and reported within the final deliverable of the project, namely: Strategic Development Programme for Braila Port.

As well, an Action Plan will be prepared. At present, the project is on-going, in progress.

Based on these 2 deliverables, CN APDM SA Galati will prepare the infrastructure investment projects portfolio for the next budgeting period (2014 – 2020) in accordance with the Transport General Master Plan of Romania, elaborated by the Romanian Ministry of Transport.

6.18.2 Links between missing infrastructure and industrial-economic development

Within the project: "Development of Tulcea Port" the future industrial-economic development of Tulcea area have been considered and the projects portfolio prepared in order to cover the infrastructure gaps / missing links for the Port of Tulcea took in account the development estimations.

6.18.3 Special infrastructure for surface pavement or other eco-friendly development

All legal requirements for infrastructure and superstructure construction works are established in the national laws, as follows:

- Law No. 50/1991 regarding the authorization of the execution of the construction works
- Law No. 17/1990 on the legal status of inland waters, territorial sea, contiguous areas and exclusive economic zone of Romania
- Water Law No. 107/1996

- Government Emergency Ordinance No. 195/2005 regarding the environment protection
- Government Ordinance No. 22/1999 on the administration of the ports and waterways, the use of the public transport infrastructure of the public domain, as well as the carrying out of the activities of water transport in ports and inland waterways.

The beneficiaries of the construction works have the obligation to obtain all legally required permits, approvals, authorisations, etc. in accordance with the Romanian legal provisions in force.

The Technical Projects, which are the basis for obtaining specific construction approvals and authorisations, are obliged to respect all technical standards related to the construction category to which they refer.

6.19 Port of Constanta

6.19.1 Infrastructure gaps

The North Constanţa Port has obsolete infrastructure that is inadequate to operate new goods flows, including containers. The port connectivity could also be improved. The proposed solution is the construction of the piers III & IVS.

The southern part of Constanţa port has potential for developing a container terminal, given the major advantage offered by the high water depths. Size ships are steadily increasing, and they can only operate in deep-sea ports.

Although the current capacity in Constanta port is sufficient for current traffic, it is considered inadequate for long-term development. The congestion due to poor infrastructure or outdated administrative procedures leads to further increases in delays.

6.19.2 Links between missing infrastructure and industrial-economic development

Improvements to Romania's road and rail transport networks are needed in order to improve travel times and lower and more competitive transport costs. Effective route times will encourage more carriers to choose routes to or through Romania. Currently the transit of goods to landlocked countries such as Hungary and Austria is diverted through the Mediterranean Sea and the ports of Adriatic Sea (NAPA ports) without using the Black Sea ports. The most comprehensive is that many carriers use non-Romanian ports to import and transport freight to destinations in western Romania, such as Arad.

Improvements to road and rail facilities and multimodal terminal conditions at Constanta Port will increase efficiency, thus reducing costs and, as a result, encourage the revitalization of freight transport in port.

A network of over ten terrestrial multimodal terminals is needed in order to stimulate the domestic and international rail freight services network.

6.19.3 Special infrastructure for surface pavement or other eco-friendly development

The proposed Constanta Green Port Action aims to improve the environmental profile of Constanta port by developing a comprehensive and state of the art Port Envi A network of over ten terrestrial multimodal terminals will most likely stimulate the domestic and international rail freight services network.ronmental Management System, while focusing on finding solutions to reduce external costs, prevent damages to health and pollution of air, water and soil. Setting up and executing training of all port employees and the stimulation of the know-how transfer will be encouraged both in-house for the port administration and also between the port administration and private port operators. A multi-annual action programme consisting of prioritised measures for the defined areas of action will be elaborated.

The reader is referred to the Romanian legal framework regarding the environment protection during the building and use of port infrastructure in section 6.1.3.

7 Overall analysis of Danube ports infrastructure

7.1 Port infrastructure and capital assets

All nineteen Danube ports selected for this analysis demonstrated variations in terms of governance and ownership of port land and port infrastructure. It is considered that a selection of 19 Danube ports represents a statistically significant sample enabling a reliable basis for the overall assessment of all operationally significant ports on the Danube.

In this view, it can be safely stated that the land in by far the largest majority of Danube ports is publicly owned. This is, in the opinion of the responsible author of this report, the best possible solution since the port land represents a finite and strategic asset of any country and therefore needs to be governed by the public sector of different tiers (state, region or city/municipality). Among 19 selected ports, the state owns the port land in 15 ports, while the city (municipality) owns the land in one port. Private ownership of the port land was recorded in one port, while mixed ownership (public and private) was recorded in two ports. Following figure demonstrates the share of different ownership models in the selected Danube ports.

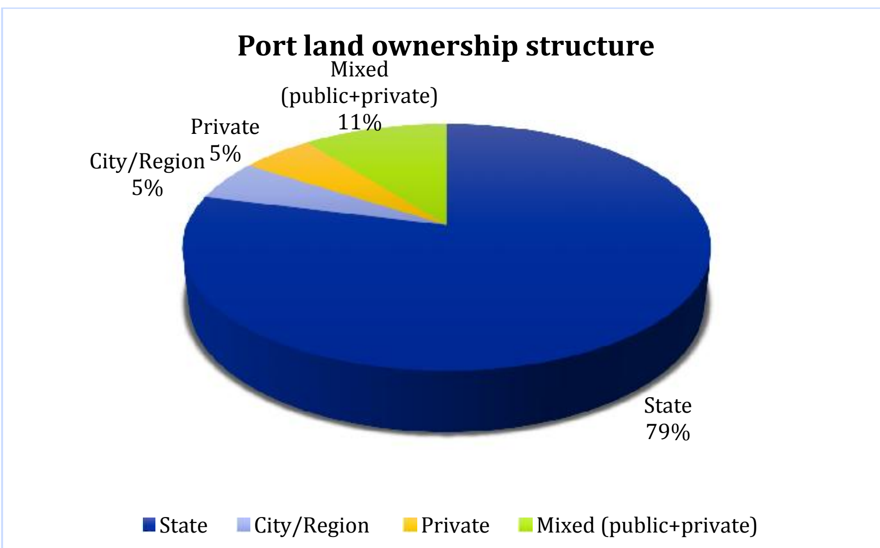

Figure 74: Port land ownership structure

(Source: iC consulenten)

As regards to the ownership of port infrastructure (basins, bank protection, breakwaters, quays, piers, docks, etc.) the state owns infrastructure assets in 11 ports, city (municipality) owns infrastructure assets in 2 ports, while private ownership of infrastructure was reported in 4 ports and mixed ownership in 2 ports. Figure 75 represents results of the port infrastructure ownership analysis.

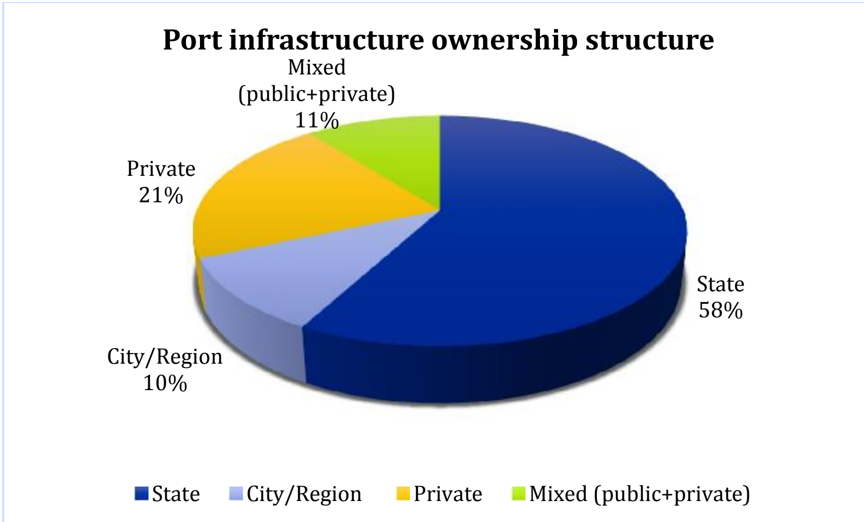

Figure 75: Port infrastructure ownership structure in Danube ports

(Source: iC consulenten)

When bodies and/or entities responsible for port governance (port authorities and similar entities) are concerned, it was reported that 15 port authorities were state owned bodies or enterprises, 2 were city/region owned, 2 were privately owned, while no mixed ownership was reported. Figure 76 shows the structure of ownership in port authorities.

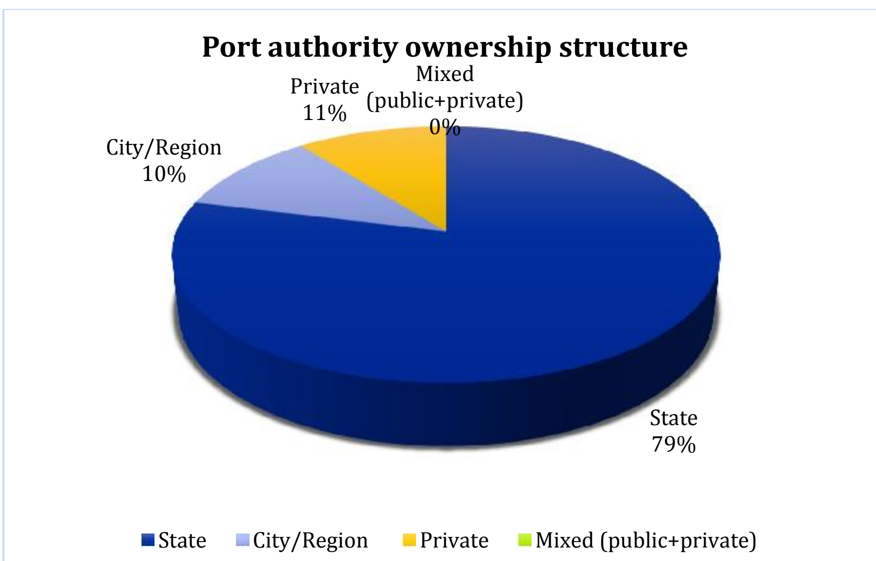

Figure 76: Port authority ownership structure in Danube ports

(Source: iC consulenten)

Commercial exploitation of ports is entrusted, in most of the cases, to private port operators. In this view, 13 port operating companies were privately owned, while 3 ports housed a mixture of public and private port operators. The city/region owned 2 port operators and only one port had a state owned port operator using the port. Figure 77 shows a distribution on public and private operators in the selected 19 ports on the Danube.

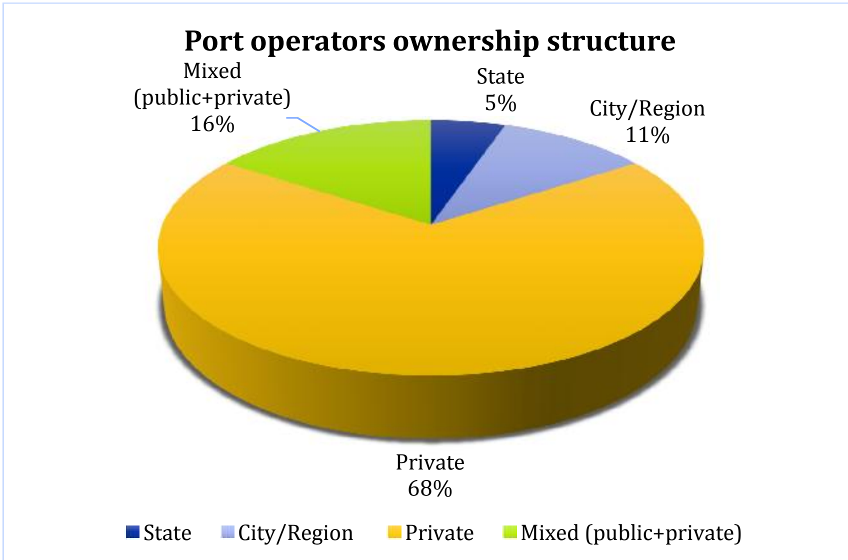

Figure 77: Ownership of port operators in Danube ports

(Source: iC consulenten)

Port governing and port operating functions are separated in the vast majority of ports, more precisely in 17 our 19 analyzed ports. This separation of public (governance, administration) and private (operations, exploitation) functions is often seen as a perfect balance of public and private roles in the use of strategic assets such as ports.[26] Figure 78 demonstrates the distribution of separated port governance and port operating functions in the selected Danube ports.

Nevertheless, the fact that ports are usually operated by private operators, it does not have to mean that such port operators are always owned by private shareholders. Publicly owned companies working under private company laws can also successfully operate ports, as long as they are successfully corporatized or commercialized.

[26] World Bank, "Port Reform Toolkit", 2007.

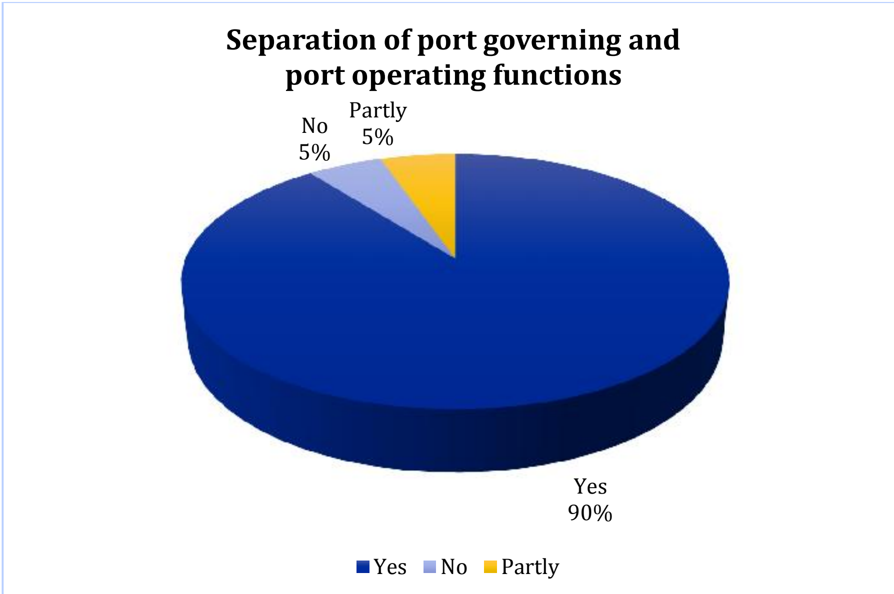

Figure 78: Separation of port governing and port operating functions in Danube ports

(Source: iC consulenten)

Danube ports demonstrate a large variety when it comes to the number of port operators. Most operators operate ports under a licensing agreement, contract or concession agreement. Figure 79 shows a number of port operators in the selected 19 Danube ports.

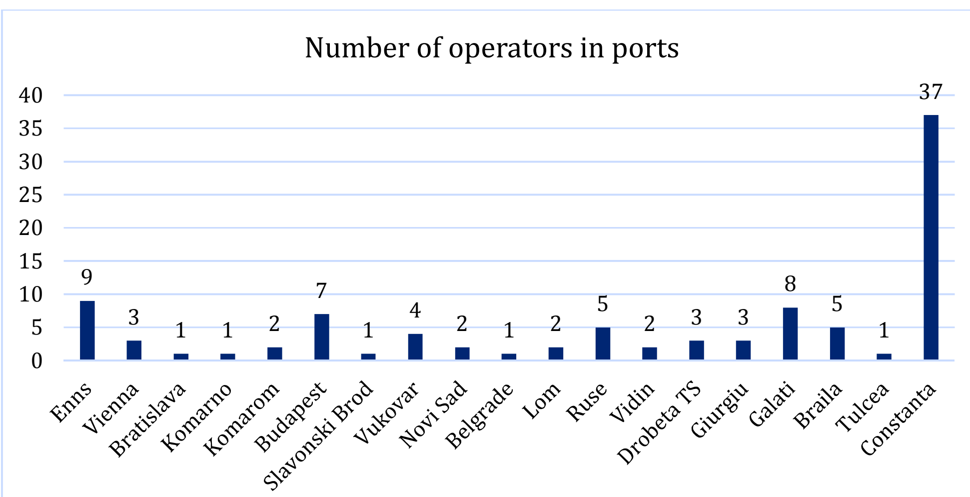

Figure 79: Number of port operators in the Danube ports

(Source: iC consulenten)

It goes without saying that by far the largest number of port operators was reported in the Port of Constanta due to its sheer size. Port of Constanta, frequently referred to as the

"Rotterdam of the East", is the largest seaport in the Danube region and is therefore a host to a very large number of different port operators.

Size of port areas vary significantly and stretch from small ports, such as Komarom (HU), having only 3 ha in the size of the port area, to very large river ports, such as Vienna and Enns (AT), each having ca. 350 ha of the port area. Seaport of Constanta is by far the largest port in terms of the port area, having the surface of 1.313 ha. Figure 80 demonstrates the comparison of ports in terms of the size of port areas.

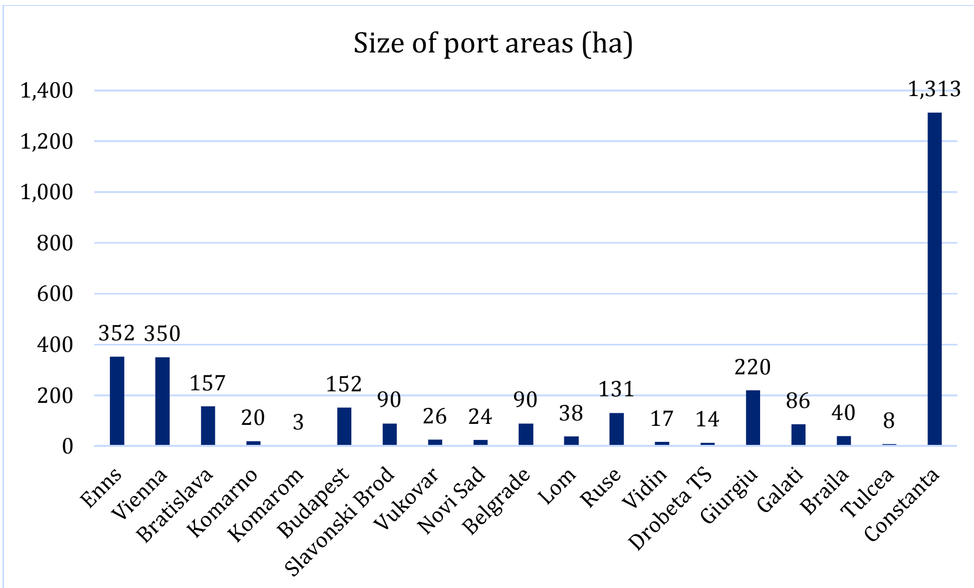

Figure 80: Comparison of ports in terms of port area size

(Source: iC consulenten)

The situation with the free space for further port development, however, is not so convenient for most of the ports, with the exception of the Port of Constanta which, as a very large seaport, has significant development space available. Available space for further port development stretches from virtually zero hectares in the ports of Vienna (AT), Komarom (HU), Vukovar (HR), Novi Sad (RS), Belgrade (RS) and Giurgiu (RO), to maximum 50 ha in Enns (AT) and 95 ha in Bratislava (SK). Figure 81 shows the distribution of available space for port development in Danube ports.

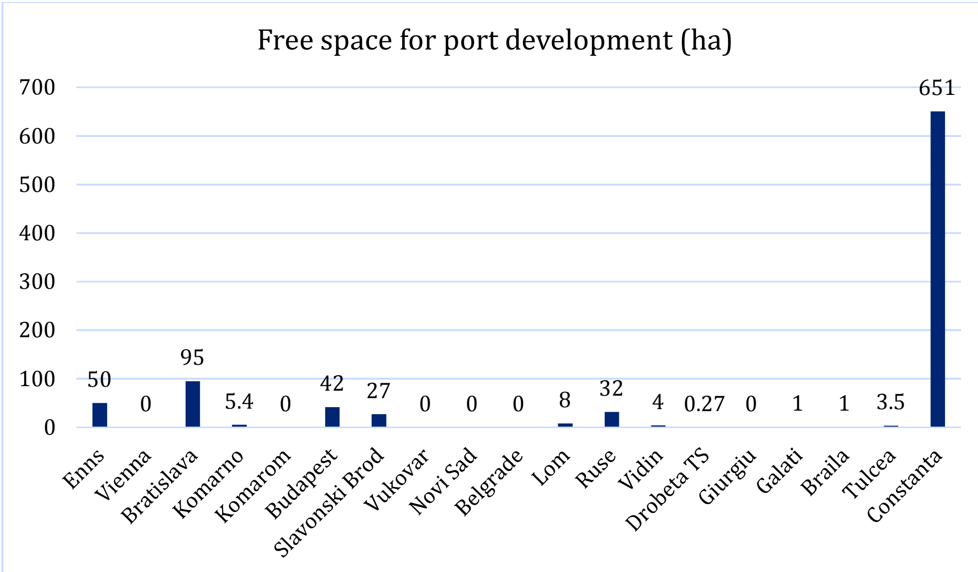

Figure 81: Available space for further development in Danube ports

(Source: iC consulenten)

Another indicator of the port size and its ability to serve its core business – waterside cargo handling (a.k.a. ship-to-shore operations) is the length of operational quays. In this case, ports show considerable differences in quay length, starting from just (currently) 120 meters in the Port of Slavonski Brod on the Sava River (Danube's largest tributary) in Croatia to 8.455 meters in Bratislava. Seaport of Constanta has, logically, the longest quay line of almost 30 kilometers. Lengths of quay walls in all ports in shown in Figure 82.

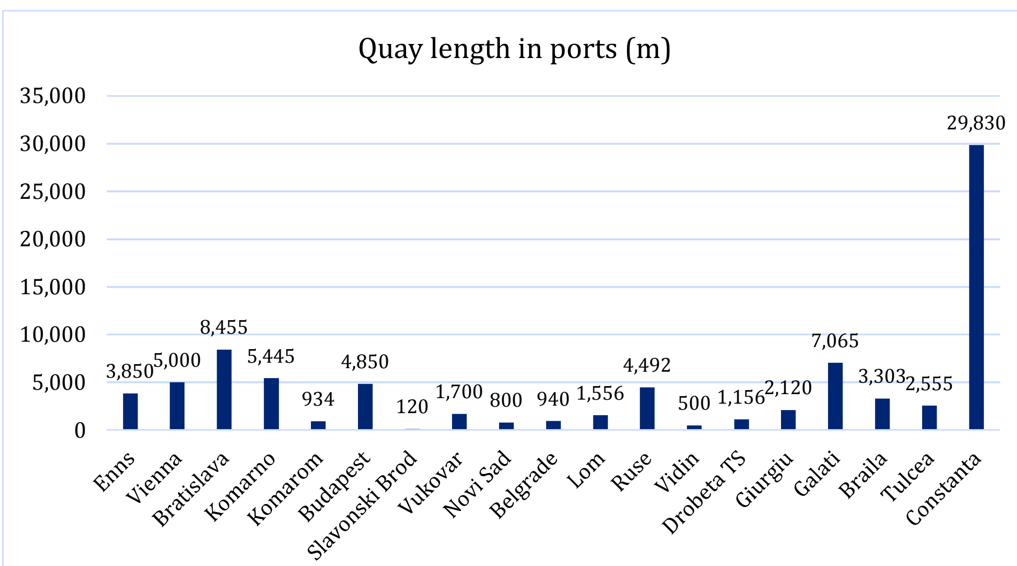

Figure 82: Quay lengths in Danube ports

(Source: iC consulenten)

In port operations technology, vertical quays are often seen as a preferred way of quay wall layout for inland ports, in spite of the higher costs of their construction when compared to the old fashioned sloped (inclined) quay walls. This is primarily due to the fact that sloped (inclined) quay walls operations are very dependent on water levels. The lower the water level, the longer the reach of a crane loading/unloading a vessel. This flaw is especially important for portal or jib cranes as their lifting capacity decreases with the reach. This significantly slows down the operation of loading/unloading. On the contrary, vessels berthed along the vertical quay are always at the same distance from the crane vertical axis thus making the loading/unloading easier when the water levels are low. Based on these facts, it is common to state that the ports with longer length of vertical quays are technologically more advanced than those ports still using the sloped quay walls. Figure 83 demonstrates the share of vertical quay length in total quay length in all ports.

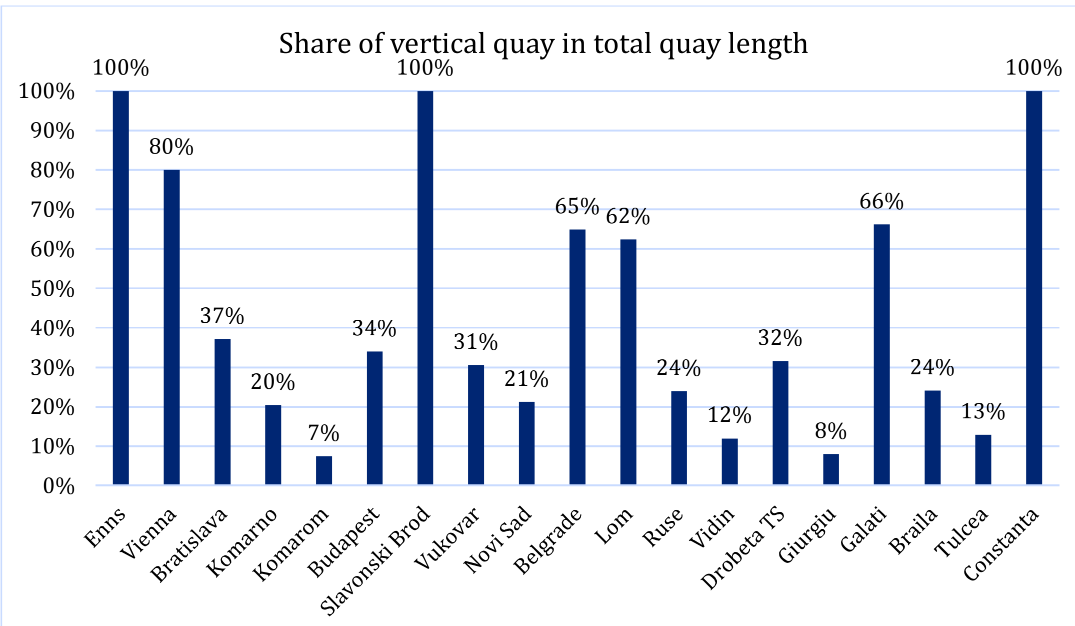

Figure 83: Percentage of vertical quay length in total quay length

(Source: iC consulenten)

Another useful indicator or port's capability is its total capacity for cargo handling in a year. It is usually defined as a maximum cargo handling capacity of all terminals within a port area within a given port service pattern or a maximum quantity of cargo that can be un/loaded with the existing equipment. Port maximum capacity is also referred to as the technical capacity. However, one of the usual problems in defining and recording the port capacity in practice is the fact that, in spite of the commonly accepted definition, various ports understand the term port capacity in different ways. Some ports understand it, and record it, as the maximum waterside handling, while others (minority) calculate port capacity as a *throughput* in tons per unit length of quay wall per year. The former definition is the simplistic one and we will use it in this report for the purposes of simplicity. The latter definition, however, is more a measure of *efficiency* of port infrastructure, where port operators or port authorities measure the annual throughput of cargo in tons per unit length of a quay wall which *can* pass through the port under the assumed working hours, number of employed gangs, available land transport units (wagons and trucks) for inland distribution of unloaded cargo (or vice-versa), dwell time of cargo in the base or transit storages, reduced for the influence of downtimes, bad weather, inspections, closing and opening of hatches of every vessel, number of shifts, number of days worked in a week, etc. This capacity is also called the *throughput capacity*. It is, however, rarely measured by inland ports and used only in port planning and in academic research of port productivity. More commonly available figure is related to the aforementioned technical capacity for waterside handling (ship-to-shore operations.)

In this view, the technical capacity, or the cargo handling capacity of the selected Danube ports is demonstrated in Figure 84.

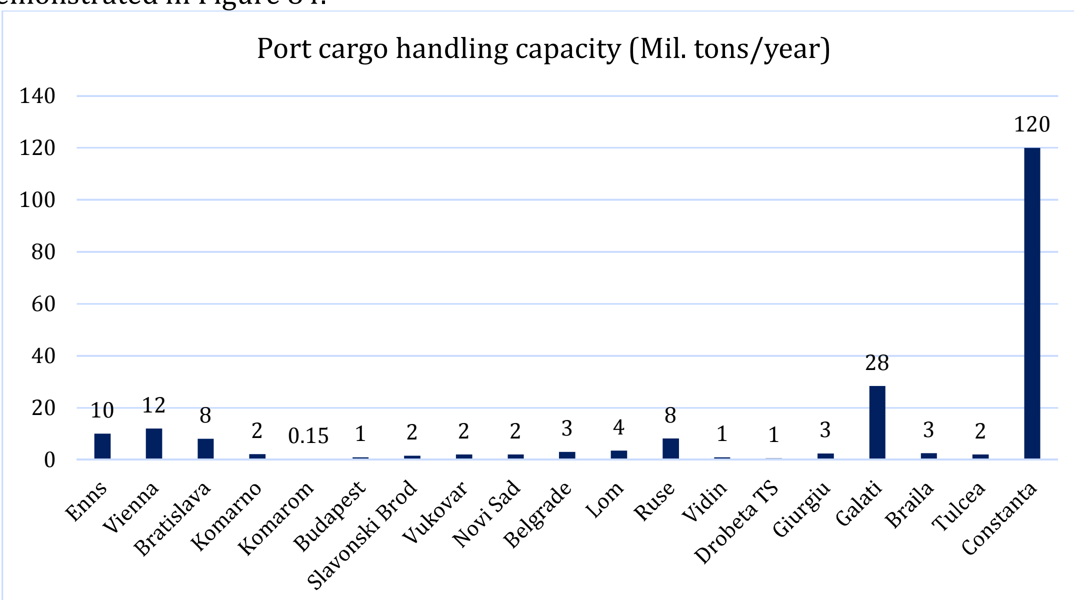

Figure 84: Cargo handling capacities in Danube ports

(Source: iC consulenten)

When an average annual throughput over 10 years of available statistical records (where available) is calculated and compared to the reported capacity, an average utilization of port capacities is obtained. This indicator demonstrates a clear picture of the utilization of the port under analysis. Figure 85 shows average utilization of port capacities.

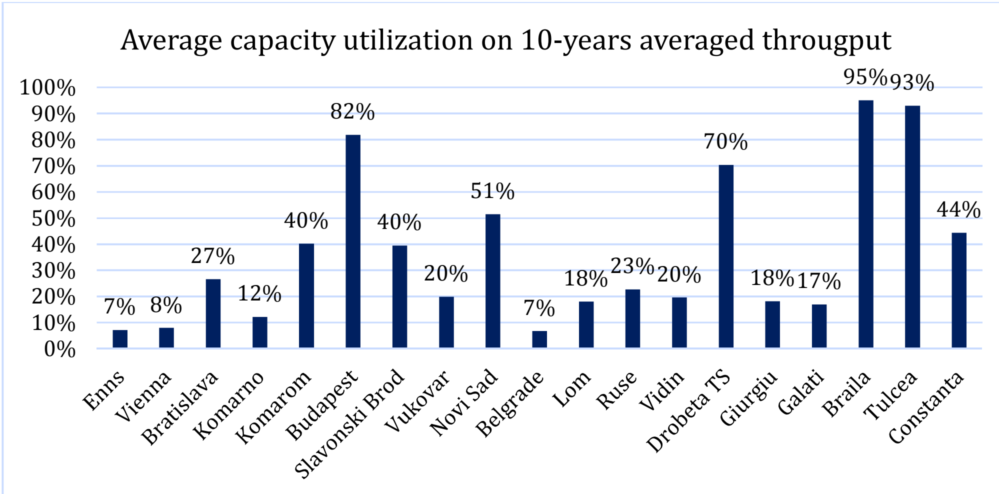

Figure 85: Average port capacity utilization in Danube ports on 10 years average

(Source: iC consulenten)

Provided that the port capacity is not misunderstood as port throughput, the above figure shows that there are at least 5 ports whose capacity utilization is above 50% over the 10-years averaged throughput. This, on the one hand, is positive in terms of business, but on the other hand, may be a signal of either outdated procedures or equipment, or of simply physical limitations of the port. Proper port planning will not wait that the capacity utilization reaches maximum levels as the goods owners will simply move to either another port in the vicinity, or they will change the transport mode, whenever possible, due to the congestion problems that can become inevitable whenever the capacity reaches the levels above 50%. This is connected with the degree of berth utilization (berth occupancy), for which there is a recommendation for an acceptable degree of occupancy, as shown in Table 18 for the berths where general cargo and bulk cargo are handled[27]. Unfortunately, no concrete measurements of berth occupancy in Danube ports were done due to unavailability of data needed for such measurements – average rate of arrival of vessels and average rate of loading/unloading of each vessel.

Table 18: Recommended maximum berth occupany for general and bulk cargo

Number of berths	Recommended maximum berth occupancy %
1	40
2	50
3	55
4	60
5	65
6-10	70

(Source: Radmilović, 2002)

[27] Zoran Radmilović, “Planning and Development of Ports and Harbours“, Faculty of Transport and Traffic Engineering, Belgrade, 2002. (In Serbian)

Another interesting indicator of port infrastructure efficiency is the average quay utilization – an indicator which measures the ratio between the 10-years averaged throughput and the total quay length. This parameter shows an average throughput of cargo per unit length of the quay. Values for the selected Danube ports are given in Figure 86. Purpose of this performance indicator of the port infrastructure is simple – the higher the ratio, the higher the efficiency of port operational setup. From this parameter, it can be seen that the ports with much lower total quay length may sometimes be more efficient than the ports having many kilometres of quay walls. Needless to say, such statistics can sometimes be deceiving, depending on the way ports keep their statistical records. In Figure 86 it can be seen that, for example, the Port of Slavonski Brod has the highest possible quay utilization. However, when a thorough analysis of statistical data is performed, it can be seen that this port has only 120 m of quay wall and that it has an average quay utilization factor of 4.994 tons per quay meter thanks to the transshipment records of sand and gravel and oil products in the total throughput of this particular port. These products, in many cases, do not need a quay wall to be loaded/unloaded at all. Sand and gravel are usually unloaded directly from a vessel to a river bank or pumped further from the bank in the prepared basins for the mixture of gravel, sand and water, or are unloaded with conveyors from self-unloading dredgers. Vessels carrying oil products also do not need a quay wall and in many cases are loaded/unloaded over a pipe system leaned over a pontoon or an old barge re-designed for such purposes.

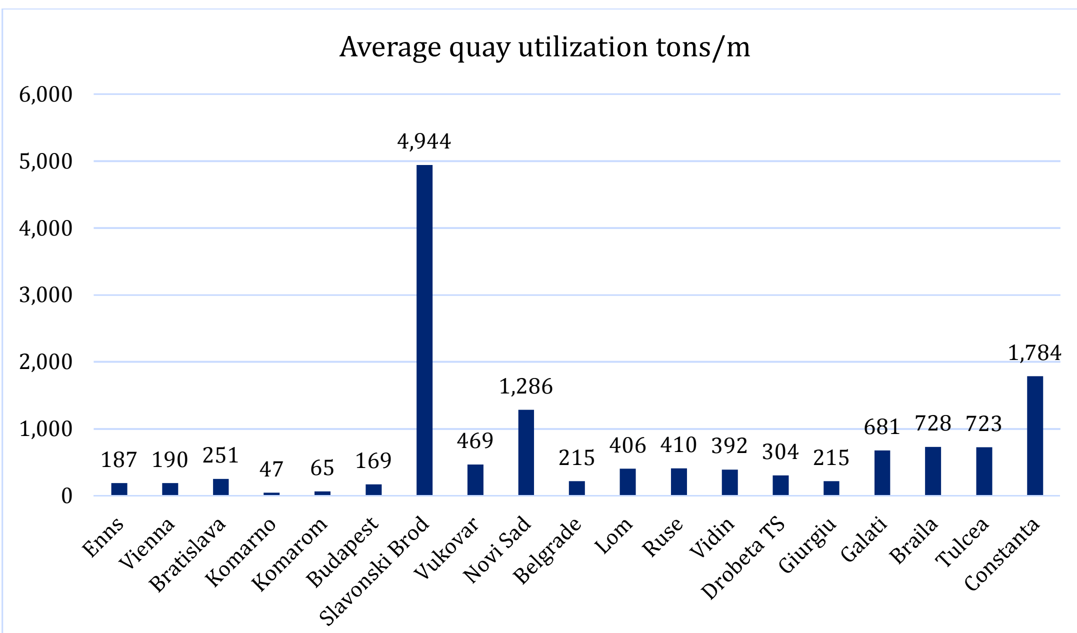

Figure 86: Average quay utilization in Danube ports

(Source: iC consulenten)

Finally, overall statistical records are given in Figure 87. This figure excludes the Port of Constanta due to the huge disproportion of cargoes handled in inland ports and in this particular seaport, making the data series lines almost invisible for other ports, if Constanta is included in the same graph.

Detailed statistics for each of the ports demonstrate that mass bulk cargo is still pre-dominant cargo on the Danube. Cargoes that were transported were mostly agri-bulk cargoes, coke, coal, ores, fertilizers, oil and oil derivatives, as well as metal products. Although recorded in some ports as their regular cargo, sand and gravel usually do not need any port facilities to be loaded/unloaded and are very local (transported over relatively short distances), and are therefore not seen as attractive cargo for ports.

It also needs to be noted that there are no regular container shipping lines on the Danube. Container transport on the Danube is virtually non-existent, in spite of the two noticeable attempts, in 2005 by Bulgarian River Shipping Company and in 2010 by Austrian company Helogistics. Both services existed for a few years between the ports of Constanta and Belgrade in Serbia. The first one (Bulgarian River Shipping Company) was using an extra container carrying barge attached to the pushed convoys running regularly between Romania and Serbia and could function until the volumes dropped and the reliability of the service dropped below levels accepted for customers. Second container shipping service (Helogistic) was operational between the ports of Constanta, Belgrade and Budapest, whereas Budapest cargo were only empty containers returning to Constanta, which was not profitable cargo for the shipping line. The service was functional for the duration of the subsidies received from the program Marco Polo II, and eventually was shut down at the end.

Currently, occurrence of containers on the Danube is sporadic and negligible. Reasons for the failure of container transports on the Danube are beyond the scope of this project.

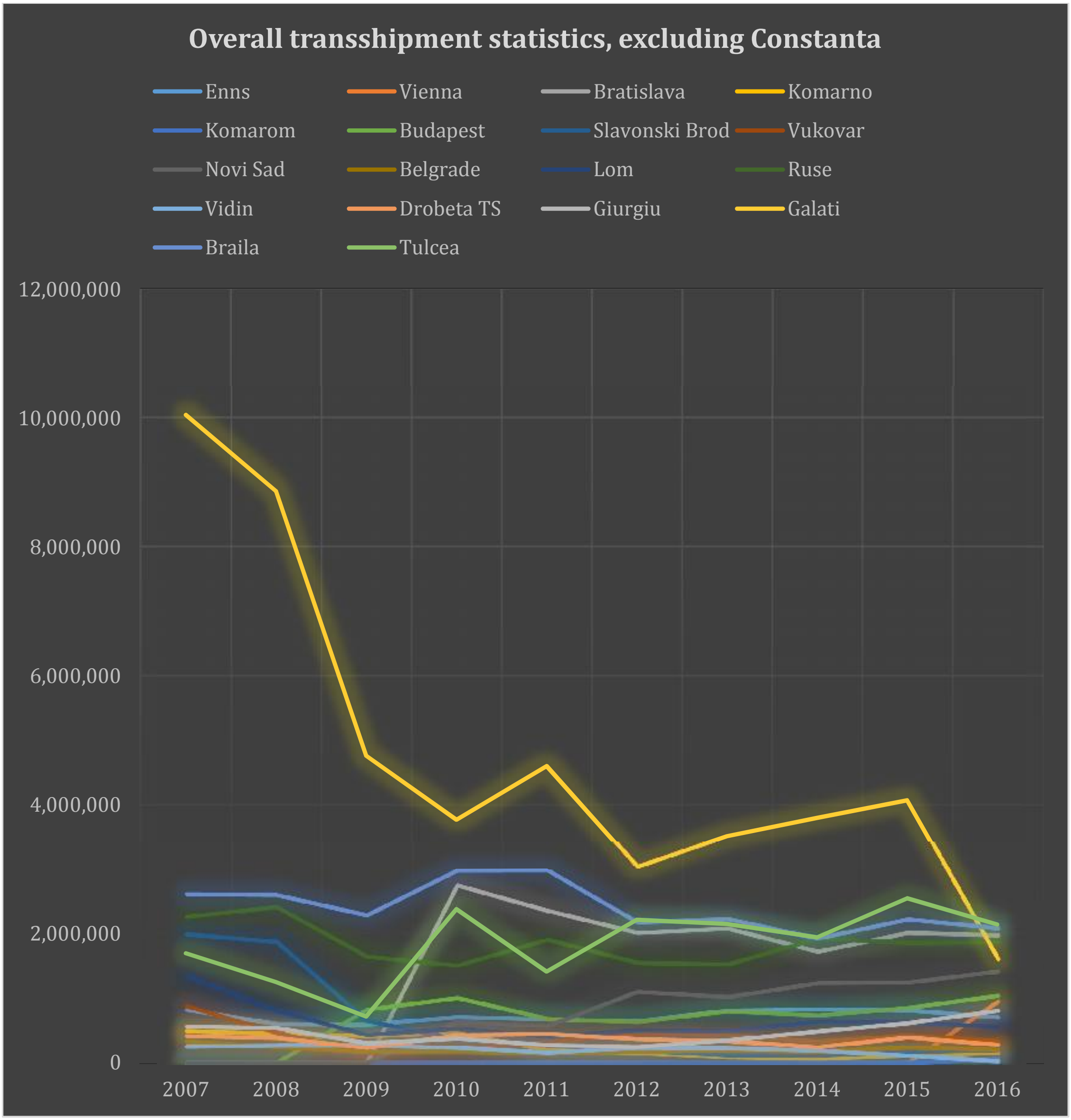

Figure 87: Overall transshipment statistics in Danube ports, excluding Constanta

(Source: iC consulenten)

Detailed ownership, governance and infrastructure data for the selected ports are given in Annex I, while detailed tabular statistical records of transshipment data for 10 years period (2007 – 2016, where available), for each port are given in Annex II of this report.

7.2 Projects for port development

During the survey of the port development directions of the selected 19 ports in the Danube area, a total of 136 projects was reported to the activity leader by participating project partners. Majority of projects were taken over from the database of projects made within the

Rhine-Danube Core Network Corridor study, but were significantly modified by the respective port infrastructure managers (port authorities), while a great number of new projects were added for the so called comprehensive ports which were not tackled in the Rhine-Danube Core Network Corridor study. Figure 88 shows the total number of port projects in each country, for their ports included in the analysis.

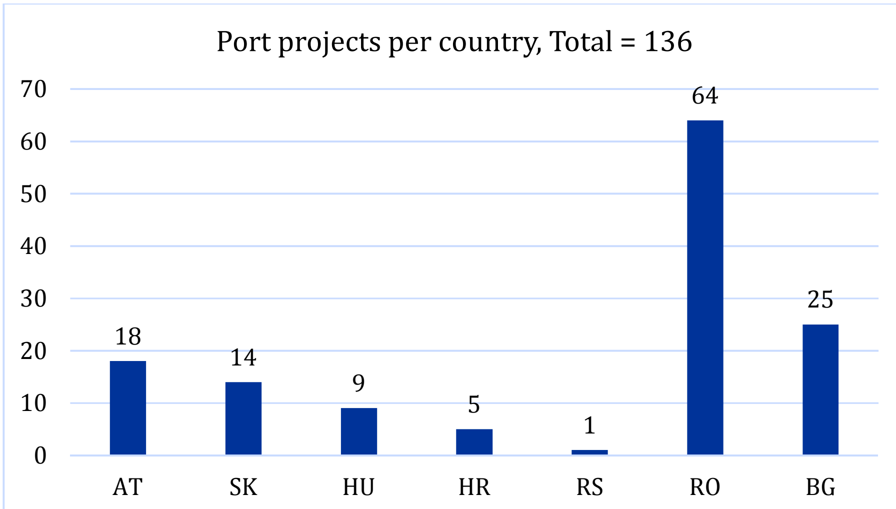

Figure 88: Total number of port development projects in Danube area ports

(Source: iC consulenten)

The largest number of port projects was recorded in Romania. The reason for this is dual: first, Romanian partners suggested 6 Romanian ports to be included in the analysis, which was accepted by the consortium; second, the seaport of Constanta was included in the analysis and has by far the largest number of projects, due to its sheer size, a total of 48 projects.

Out of the total 136 port development projects, the consortium decided to include the projects which were recently completed in all analyzed ports, namely in the period from 2012 to 2016, so as to obtain an overview of the development directions in the recent past and to connect them with the projects that are currently on-going and those that are planned in the forthcoming period. In this view, 26 completed projects were recorded, along with the 39 on-going projects and 73 planned projects. Figure 89 demonstrates the distribution of completed, on-going and planned projects in each country.

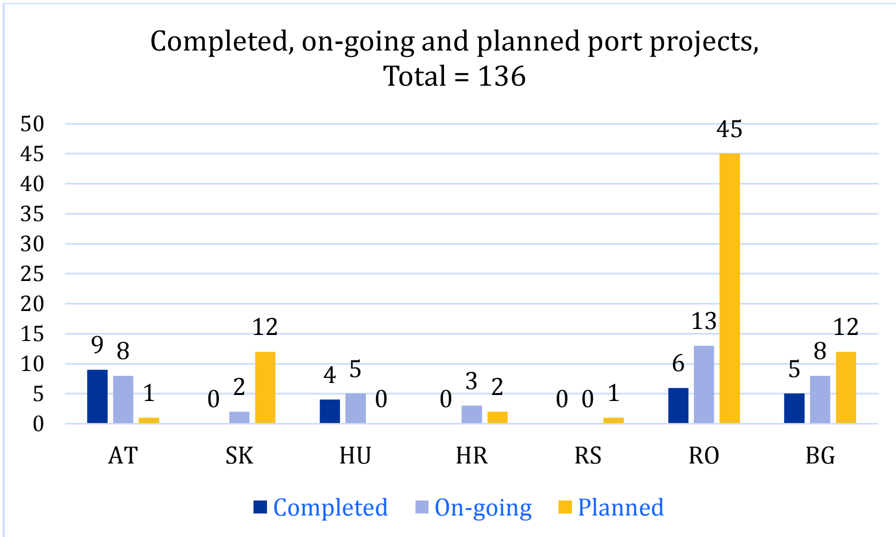

Figure 89: Distribution of completed, on-going and planned port projects per country

(Source: iC consulenten)

As already mentioned, from the breakdown of projects per ports, it can be noted that the seaport of Constanta has the largest number of projects, due to its size and complexity of large seaports which also have their sections dedicated for inland waterway vessels as well. In this view, Figure 90 shows the breakdown of projects in each port.

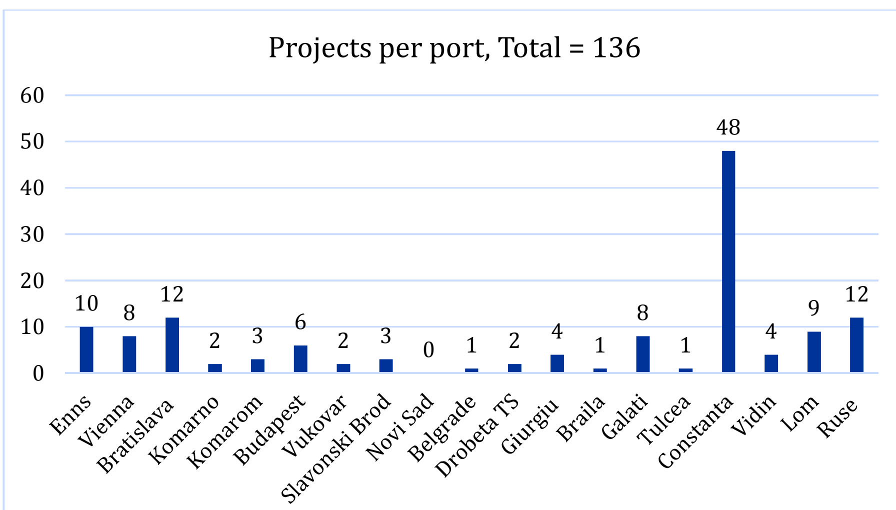

Figure 90: Port projects in each of the analyzed ports in the Danube area

(Source: iC consulenten)

Note for Figure 90: there are two projects which include Vidin, Lom and Ruse together. For the purposes of calculation, these projects are assigned to Vidin only.

Furthermore, each port was analysed for the further breakdown of ports into completed, on-going and planned projects. Project breakdown is shown in Figure 91.

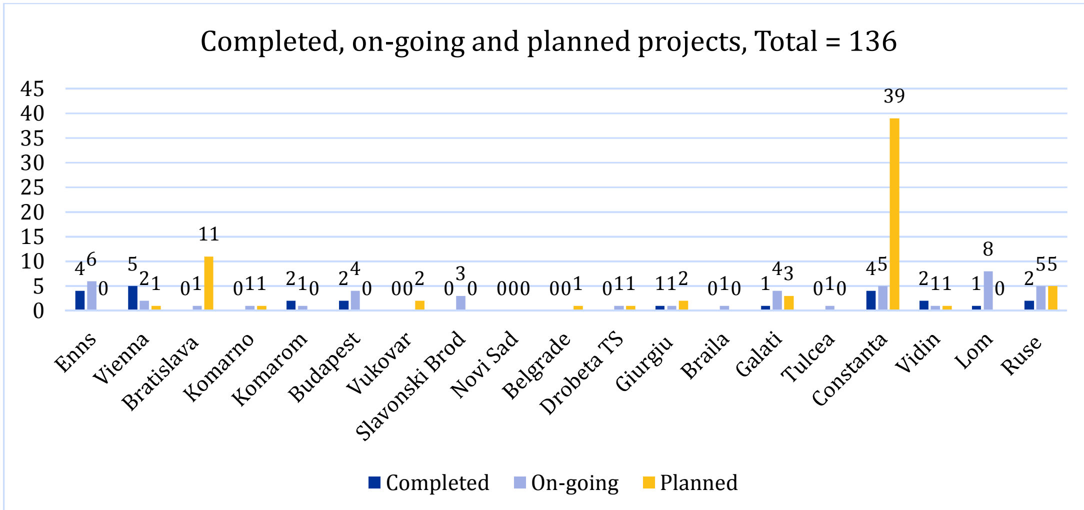

Figure 91: Breakdown into completed, on-going and planned projects in each port

(Source: iC consulenten)

In terms of project costs, seaport of Constanta again shows considerable difference from the costs of other projects in inland ports, due to complexity, scope and size of projects for seaports. Figure 92 shows the distribution of costs of port projects in the Danube riparian countries taking part in the Daphne project.

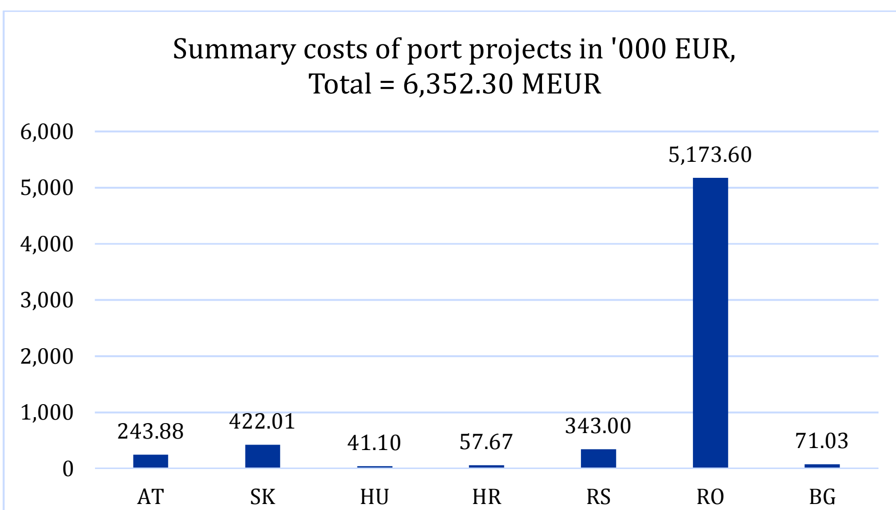

Figure 92: Summary costs of port projects in selected Danube ports

(Source: iC consulenten)

When the above project costs are distributed over completed, on-going and planned projects, the following situation is seen.

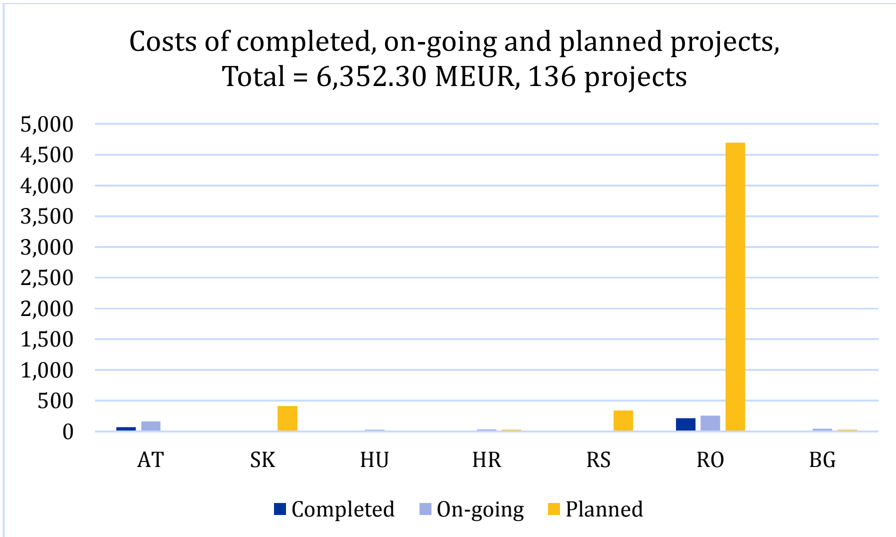

Figure 93: Costs of completed, on-going and planned port projects per country

(Source: iC consulenten)

Table 19: Costs of completed, on-going and planned port projects in each country

	Port project costs in MEUR			
Country	**Completed**	**On-going**	**Planned**	**Total**
AT	72.65	162.21	9.02	243.88
SK	0.00	7.67	414.34	422.01
HU	13.47	27.63	0.00	41.10
HR	0.00	31.90	25.77	57.67
RS	0.00	0.00	343.00	343.00
RO	213.75	259.88	4,699.98	5,173.60
BG	2.70	42.73	25.60	71.03
Total	**302.57**	**532.02**	**5,517.70**	**6,352.30**

(Source: iC consulenten)

It needs to be noted that a number of planned port projects did not have determined costs at the moment of writing of this report and that some on-going or completed project costs were not available for public use.

When project costs are broken down to individual ports, it can be noted that the majority of port projects are well below 100 million Euro, with the exception of the projects in the ports of Constanta, which has the highest total project costs of 4.8 billion Euro, and other six ports which have project costs higher than 100 million Euro. Breakdown of project costs for each individual port under analysis is given in Figure 94 and Table 20.

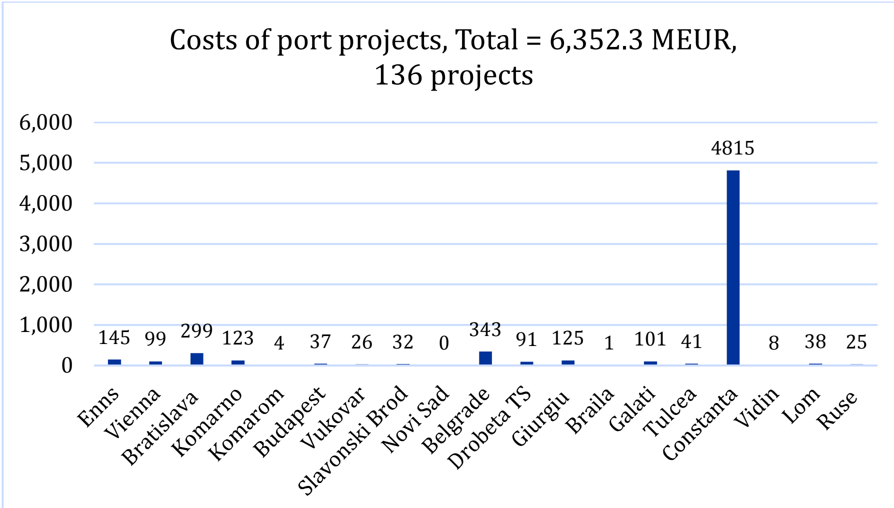

Figure 94: Breakdown of port projects costs in individual ports

(Source: iC consulenten)

Table 20: Breakdown of port projects in individual ports

	Project costs (MEUR)			
Port	**Completed**	**On-going**	**Planned**	**Total**
Enns	44.51	100.10	0.00	144.61
Vienna	28.14	62.11	9.02	99.27
Bratislava	0.00	7.00	292.22	299.22
Komarno	0.00	0.67	122.12	122.79
Komarom	2.58	1.05	0.00	3.63
Budapest	10.89	26.58	0.00	37.47
Vukovar	0.00	0.00	25.77	25.77
Slavonski Brod	0.00	31.90	0.00	31.90
Novi Sad	0.00	0.00	0.00	0.00
Belgrade	0.00	0.00	343.00	343.00
Drobeta TS	0.00	71.00	20.00	91.00
Giurgiu	0.80	15.59	108.53	124.93
Braila	0.00	0.72	0.00	0.72
Galati	0.29	44.00	56.48	100.77
Tulcea	0.00	41.00	0.00	41.00
Constanta	212.66	87.56	4,514.97	4,815.19
Vidin	0.00	8.00	0.00	8.00
Lom	0.10	38.00	0.00	38.10
Ruse	2.60	22.33	0.00	24.93
Total	**302.57**	**557.62**	**5,492.10**	**6,352.30**

(Source: iC consulenten)

If data from the Table 20 are analysed, it can be concluded that the investments in ports are generally on the rise, taking into account the comparison between the completed projects and on-going projects, for which the finances have already been secured. If the planned projects are taken into consideration, in spite of the fact that there are no guarantees that all of the planned projects will be financed, it can be noted that the port investments will be almost ten times higher than the on-going ones. Regardless of the financial destiny of the planned projects, it is safe to conclude that the port investments are constantly on the rise since 2012 which was taken as the base year for the completion year of port investment projects.

In terms of the scope of work of port projects (Figure 95), the largest share of projects belongs to rehabilitation and upgrade works (40 projects) and construction of new infrastructure assets (58 projects). Only 22 projects are reported to cover only studies, while 11 projects contain both studies and works, where studies are referred to as feasibility studies, master plans and designs studies, all leading towards the concrete physical works on port infrastructure. Minor number of projects were related to dredging equipment, specialized vessels for port waste collection and safety, administrative operations and telematics.

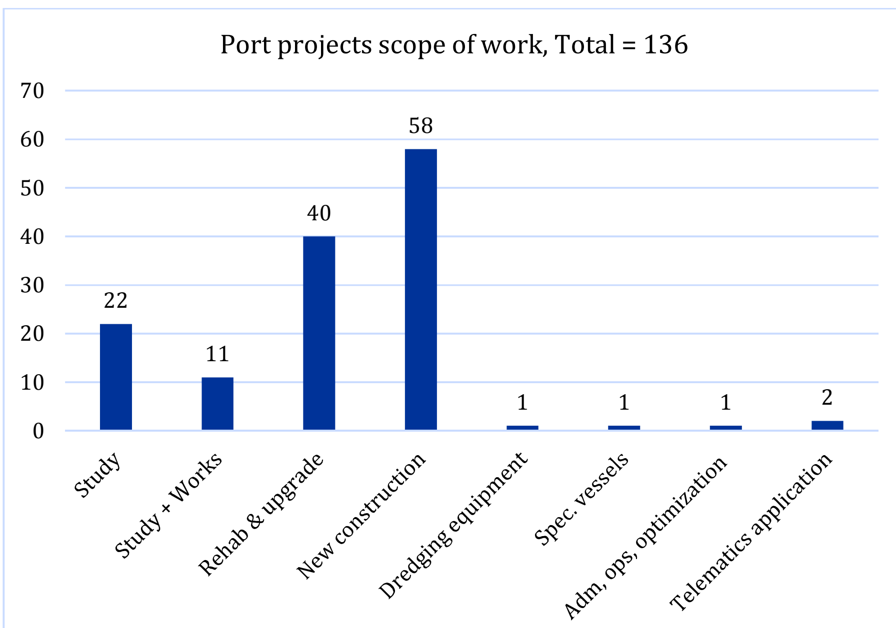

Figure 95: Scope of work of port projects

(Source: iC consulenten)

As far as the type of works in port development projects are concerned, most of the projects deal with extension of the waterside capacity, which is a positive sign from the point of view of increase of inland waterways transportation. Total of 24 projects deal with improvement of road connection or internal roads in ports (11 projects) and improvement of rail connection or internal rail capacities within ports (13 projects). What is especially encouraging is the fact that ports are keeping the pace with other transport nodes and modes in terms of combating greenhouse gasses (GHG) emissions. In this view, 7 port development projects are dealing with construction of alternative clean fuels facilities, while 8 projects involve greening of port operations through incorporation of electric-driven equipment, solar power, LNG powered machinery, waste management, etc. Type of works in port development projects are shown in Figure 96.

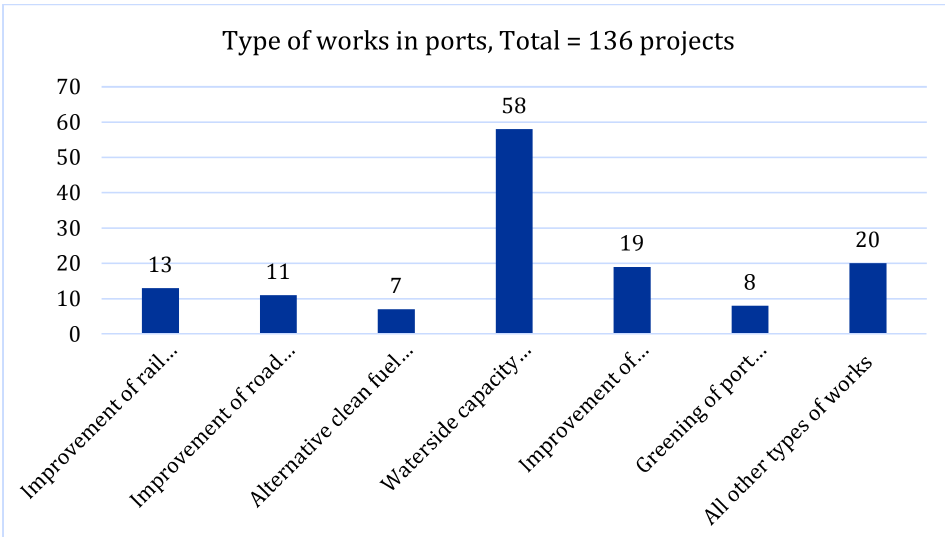

Figure 96: Type of works within port development projects

(Source: iC consulenten)

One of the projects dealing with greening of ports which are completed was the project which involved ports of Vidin, Lom and Ruse in Bulgaria. This project, completed in 2015, had the objectives to identify needs of investments in reception and processing facilities for ship generated waste, to standardize procedures and reduce administrative burden and costs for documentation, control and monitoring of activities of waste management in the Bulgarian public transport ports.

Another project involving greening of ports is the project "Masterplan and further stepwise realization for surface pavement & drainage systems and water pre-treatment for total area" in the port of Enns (AT), started in 2016. This project foresees elaboration of a masterplan and preparation of further stepwise realization for surface pavement & drainage systems (debundling, divestments, separations, new strategic lines and cost estimations; planning for best practice standard for eco-friendly port on the Danube, singular water pre-treatment devices for different areas or collecting system and combined system (incl. pumping, watching, analysing of water parameters, ...).

In the seaport of Constanta, an important port greening project is currently being implemented (2016 – 2019), the project "Upgrade of infrastructure and environmental protection of the Constanta port – PROTECT". This project involves an upgrading of basic port infrastructure, constructing a new on-shore waste collection facility, upgrading the signaling system in the port basin and the fairway, and purchasing five technical vessels. In addition, it foresees elaborating studies for: proper waste management in the oil terminal; generation and distribution of renewable energy in the port area and related public-private partnership potential; and evaluation of the port infrastructure's resilience to climate change, training on waste handling, pollution and fire prevention is as well foreseen. The Action is embedded in the master plan for the port of Constanta, elaborated with EU funding.

Second project related with the greening of the port of Constanta is the project titled: “Constanta Green Port”, yet to be elaborated (unknown start and end dates – depending on the financing schemes). This project aims at an improvement of the environmental profile of Constanta port by developing a comprehensive and state of the art Port Environmental Management System, while focusing on finding solutions to reduce external costs, prevent damages to health and pollution of air, water and soil. It involves setting up and executing training of all port employees and the stimulation of the know-how transfer will be encouraged both in-house for the port administration and also between the port administration and private port operators. A multi-annual action program consisting of prioritized measures for the defined areas of action will be elaborated within this project.

Finally, the time frame for all identified port development projects is given in Figure 97.

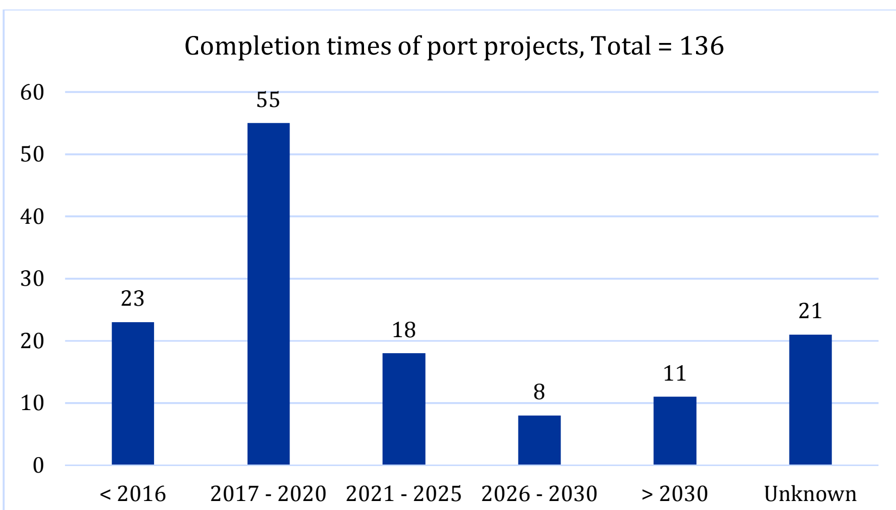

Figure 97: Time frame for execution of the identified port development projects

(Source: iC consulenten)

It needs to be noted that the largest number of projects are either on-going projects or are planned within the current decade. Unfortunately, a relatively large number of projects have the start and end date unknown, meaning that the financing of those projects have not been secured until the moment of writing this report, or that the projects are not mature enough to have the financing figures ready at this moment.

Complete list of projects identified in the 19 selected ports in the Danube area is given in Annex III.

7.3 Infrastructure gaps self-assessment

All ports participating in this project have identified their most important infrastructure gaps, regardless of whether such gaps have been tackled within on-going and planned projects or not. Details of infrastructure gaps reported by participating ports are given in Chapter 6 of this report for each port, respectively.

In relation to the identified gaps, a matrix of the most important gaps, needed to be tackled in order to facilitate unhindered development of ports as important nodes of the overall transport network, is elaborated within this study. The self-assessment infrastructure gap matrix was intended to enable the ports themselves to identify their infrastructure gaps, with the assistance of the study team. The results of the self-assessment are summarized in the matrix given in Table 21.

From this matrix, it can be safely concluded that many ports in the Danube area are focusing their development towards the construction and provision of intermodal facilities. However, this may be seen as a double-edged sword. Taking into account that intermodal transportation (e.g. container transportation) on the Danube is virtually inexistent, except for the containers in the seaport of Constanta which are being exported and imported via maritime transport, and sporadic transport of empty containers on the upper Danube, it needs to be noted that inland ports are increasingly using their port areas for bi-modal intermodal transport, involving only or mostly rail and road transport. Of nearly a million of containers transhipped in, for example, ports of Enns and Vienna, only a negligible (less than a value of statistical error) amount of containers are being loaded/unloaded to/from inland vessels. Starting from the axiom that the core business of ports is ship-to-shore operations, it can be concluded that many ports are using their space for the bi-modal (rail to road and vice-versa) land-to-land transportation, and that some of them are even reclaiming the land from the basin waterfront areas (thus reducing the number of ship berths) in order to provide space for land-to-land bi-modal transportation. It is true that ports are intermodal nodes by definition, as they are meant to provide onward distribution or pre-haulage for the cargoes being loaded onto, or unloaded from vessels, by both rail and road transportation. Nevertheless, it is also true that, in the lack of ship-borne cargoes, ports are forced to turn to land-to-land intermodal transports as ports need to function economically and at least cover their operating costs. This can be seen through the number of "hits" (15) of the column of "Intermodal facilities" in the matrix given in Table 21.

However, it is encouraging that, apart from the analysis of the port development projects in the previous section, ports are still seeing the lack of waterside capacities as their infrastructure gaps that need to be tackled.

Table 21: Port infrastructure gaps matrix

	Intermodal facilities	Structures for precipitation pre-treatment	Quay extension	Waiting areas for vessels (waiting berths or anchorage)	Internal rail tracks extension or improvement	Rail shunting capacities	Electrification of port rail tracks	Extension of operational/handling areas	Capital (not maintenance) dredging	Internal roads extension or improvement	Rail connection to hinterland (new or improved)	Road connection to hinterland (new or improved)	Reconstruction of sloped quays to vertical quays	Ro-Ro ramps	Parking for trucks and cars waiting for loading/unloading	Additional storage area	Additional space for further development	Alternative fuels (LNG) bunkering facilities	Alternative fueled (LNG, electric, etc.) handling equipment (cranes, reach-stackers.	Waste collection facilities	Capital and/or specialized transshipment & handling equipment
Enns	X	X			X					X	X				X			X	X		
Vienna	X		X					X	X	X			X	X	X		X		X		X
Bratislava	X		X	X	X	X		X		X	X	X		X	X	X	X	X		X	X
Komarno			X	X	X	X		X		X	X	X			X	X	X				
Komarom											X		X			X	X				X
Budapest					X					X	X	X			X			X		X	
Slavonski Brod	X		X		X			X					X							X	
Vukovar	X		X		X			X		X	X	X	X	X						X	X
Novi Sad			X		X					X			X								X
Belgrade	X		X		X	X		X		X	X	X		X	X	X	X		X	X	X
Lom	X	X	X					X						X						X	X
Ruse	X		X		X		X	X			X		X							X	X
Vidin	X		X		X			X	X	X			X							X	
Drobeta TS	X		X		X		X			X	X	X									X
Giurgiu	X		X	X				X	X		X					X					

	Intermodal facilities	Structures for precipitation pre-treatment	Quay extension	Waiting areas for vessels (waiting berths or anchorage)	Internal rail tracks extension or improvement	Rail shunting capacities	Electrification of port rail tracks	Extension of operational/handling areas	Capital (not maintenance) dredging	Internal roads extension or improvement	Rail connection to hinterland (new or improved)	Road connection to hinterland (new or improved)	Reconstruction of sloped quays to vertical quays	Ro-Ro ramps	Parking for trucks and cars waiting for loading/unloading	Additional storage area	Additional space for further development	Alternative fuels (LNG) bunkering facilities	Alternative fueled (LNG, electric, etc.) handling equipment (cranes, reach-stackers,	Waste collection facilities	Capital and/or specialized transshipment & handling equipment
Galati	X	X	X		X					X	X			X				X			
Braila	X	X	X		X					X	X	X		X				X			
Tulcea	X	X	X		X					X	X	X	X	X				X			
Constanta	X		X		X	X	X			X	X	X			X			X	X		

(Source: iC consulenten, based on data provided by EHOO, POV, VPAS, HFIP, BPICO, APDM, PAV and MPAC)

It is very important to note that, according to the number of hits of different gaps categories, the number one gap for ports is still the lack of sufficient quay space, or the quay length. A total of 16 (out of 19) ports have identified the need to extend the quay length, that is, their waterside capacities. The importance of this lays in the fact that ports need, on the one hand, to respond to the growing demand for vessel handling facilities and, on the other hand, to offer additional quay capacities in order to prevent vessel operators to divert to other ports in case of continuous port congestion problems, or to keep the cargo receivers or shippers to use their port instead of choosing another port or even another transport mode if even the seasonal effects cause repetitive congestion and delays.

Another important infrastructure gap requiring attention, which received the same number of "hits" (15) as the need for intermodal facilities, is the need to improve or extend internal railway capacities. This is very logical as many ports strive to provide direct ship-to-wagon transshipment whenever possible, due to easier organisation of on-haulage or pre-haulage of cargoes and faster cargo collection or distribution, freeing space for next incoming cargoes.

Next two gap categories which received the same attention (number of "hits" = 14) are the need to improve internal road extension or improvement and rail connection to hinterland. Improvement of internal roads is needed for the daily operations in ports in situations when huge number of trucks are carrying port inbound and outbound cargoes and when internal port vehicles and handling equipment handle the cargo between the quay area and base or transit storage areas and the port gate. Rail connections (construction or improvement) to hinterland is of crucial importance since the ports need efficient and reliable connection to their hinterland and the rest of the transport network feeding the ports with their cargoes.

Due to the increase of cargo throughput and expansion of value added services for cargoes handled in ports, many ports (number of "hits" = 10) have expressed the need for an extension of cargo handling areas, usually located just behind the quay wall or between the quay wall and transit or base storages.

Almost half (9) of the analysed ports identified the need for capital and/or specialized transshipment, Ro-Ro ramps, improvement of road connection to hinterland, and handling equipment including heavy lift capacities. The reason for this is of dual nature. First, a number of ports have either outdated capital equipment (all sorts of loading/unloading cranes and similar equipment) or such equipment is nearing the end of its life cycle, making such ports lag behind more developed ports and thus jeopardizing the efficiency and reliability of entire supply chains along the given routes. Logically, the need for replacement of such equipment, which is very expensive, is on the rise. Second, ports are looking towards the new markets, such as the markets of heavy and out-of-gauge cargoes, which represent very convenient cargoes for inland waterway transportation since no special licenses or permissions or special vehicles are needed for the transport of such cargoes on inland waterways. Since not many ports possess equipment for handling of such cargoes, the orientation towards the market of high and out-of-gauge cargoes caused the need for such equipment, reflecting the pro-active attitude of ports towards new markets.

Last but not least, it is important to emphasize the fact that an increasing number of ports are showing their awareness of the need to “green” the ports and port operations. In this view, 5 ports have expressed their need for structures needed for collection and treatment of precipitation water (rain, snow, etc.) from the operational areas before their releasing back to the river, while 6 ports have expressed the need for alternative clean fuels (LNG) bunkering facilities, even though no LNG fuelled vessels currently operate on the Danube and its tributaries. Finally, 4 ports identified the need for alternative fuelled (LNG, electric, etc.) handling equipment (cranes, reach-stackers, forklifts, straddle carriers, etc.).

Summary of port infrastructure gaps ranking is given in Figure 98.

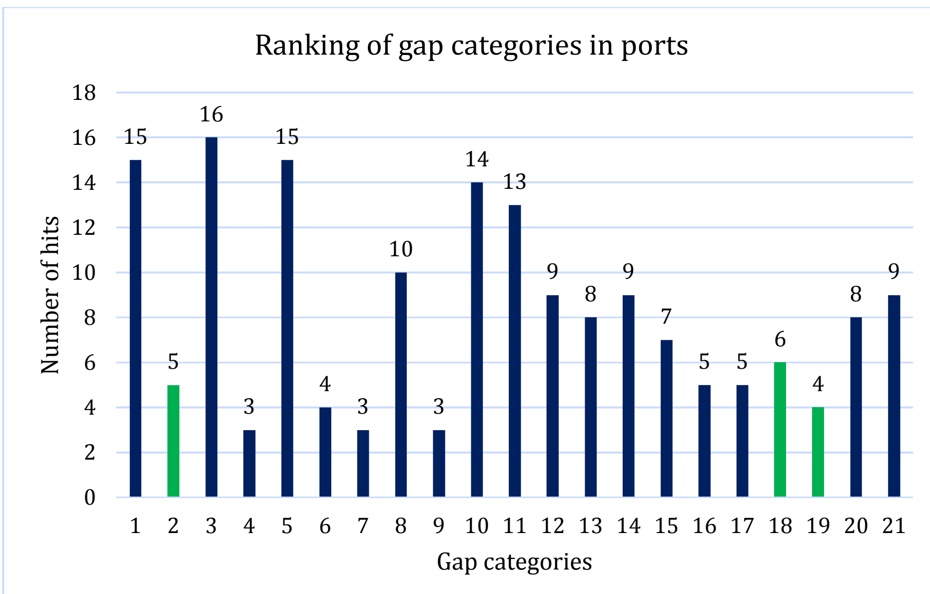

Figure 98: Ranking of port infrastructure gaps categories

(Source: iC consulenten)

Note: gap categories (1 – 21) correspond to the categories listed in Table 21, from left to right, respectively.

8 References

1. *Administrators Report* issued on 30.06.2015, N.C. Administration of Danube River Ports J.S.Co. Giurgiu 2014 (in Romanian language)
2. *Analysis of development disparities in the metropolitan area of Craiova*, www.adroltenia.ro (in Romanian language)
3. *Annual Reports*, 2007-2016, Port of Constantza, www.constantza-port.ro
4. *Current report in accordance with art.224 of Law 297/2004 regarding the Capital Market and art. 113 of the CNVM Regulation on Issuers and Operations with Real Estate Values*, no. 1708, 20.04.2011, S.C.A.E.P. Giurgiu Port S.A. (in Romanian language)
5. *Danube transport guide – Danube ports*, Romanian Intermodal Association, deliverable for Platina Project, 2013, www.ria.org.ro
6. *Decision no. 6*, issued on 26.06.2017 by General Shareholders Meeting, N.C. Administration of Danube River Ports J.S.Co. Giurgiu 2014 (in Romanian language)
7. *Decision no. 88 on expressing the acceptance of receiving in the public domain of Giurgiu municipality of the land located in the city of Giurgiu, Port road, no. 1-2 having the area of 1,604, 528.00 sqm from the public domain of Giurgiu County*, 30.03.2017 (in Romanian language)
8. *Development Strategy of the Mehedinti County for the Period 2014-2020*, Optimyz Concept Solutions S.R.L., București, 2015, www.cjmehedinti.ro (in Romanian language)
9. *Feasibility Study for Fuel Terminal in Constanta*, prepared by Stopford for Vadeco SRL, 2/05/2013
10. *Feasibility study: Port of Slavonski Brod*, Deloitte, 2003.
11. *General Master Plan of Transport in Romania- Revised final version of the Report on the Master, Short and Medium Term Plan*, Ministry of Transport, September 2014 (in Romanian language)
12. *Grain Terminal at berth no.80 in Constantza South Port* -documentation for obtaining the environmental agreement, IPTANA SA, January 2015, *http://apmct.anpm.ro* (in Romanian language)
13. *High Performance Geen Port Giurgiu 2012-EU-18089-S Final report*, www.ilr.com.ro
14. http://oalom.acstre.com/subsection-62-.html / - Plan for development of Lom Municipality 2014 -2020
15. http://oblastmontana.org/index.php?do=cat&category=planove-i-strategii – regional plan for development of North-western region for the period 2014 - 2020
16. http://rail-infra.bg/%D1%81%D1%85%D0%B5%D0%BC%D0%B0-%D0%BD%D0%B0-

%D0%BC%D1%80%D0%B5%D0%B6%D0%B0%D1%82%D0%B0/ / - scheme of the railway network in Bulgaria
17. http://ruse.bg/strategicheski-dokumenti - Regional strategy for development of Ruse province 2014 - 2020
18. http://vidin.bg/pages/%D0%9F%D1%80%D0%BE%D0%B3%D1%80%D0%B0%D0%BC%D0%B8,%20%D0%BF%D1%80%D0%B0%D0%B2%D0%B8%D0%BB%D0%BD%D0%B8%D1%86%D0%B8,%20%D1%81%D1%82%D1%80%D0%B0%D1%82%D0%B5%D0%B3%D0%B8%D0%B8%20%D0%BF%D1%80%D0%B8%D0%B5%D1%82%D0%B8%20%D0%B8%20%D0%B4%D0%B5%D0%BA%D0%BB%D0%B0%D1%80%D0%B0%D1%86%D0%B8%D0%B8%20%D0%BE%D1%82%20%D0%9E%D0%A1 – Plan for development of Vidin Municipality
19. http://www.api.bg/index.php/bg/karti/republikanska-ptna-mrezha/ – Map of the Bulgarian road network
20. http://www.ennshafen.at/
21. http://www.marad.bg/page.php?category=136&id=1025 - Regulation № 25/ 01.03.2017 of the Director of "River supervision – Lom" Directorate, Executive Agency Maritime Administration
22. http://www.marad.bg/upload/docs/Rs_razp_59.pdf - Regulation № 59/ 11.11.2016 of the Director of "River supervision – Ruse" Directorate, Executive Agency Maritime Administration
23. http://www.nkr.government.bg – National Concession Registry
24. http://www.nsi.bg/bg/content/797/%3F – regional statistical data
25. http://www.optransport.bg/en/page.php?c=209 - Operational programme on transport and transport infrastructure 2014 - 2020
26. http://www.portinvest.bg – web site of Port Invest LTD. – concessionaire of Port of Lom
27. http://www.portsvishtov.com - web site of Port Svishtov
28. http://www.tpp-sviloza.bg/index.php/bg/ - web site of TPP Sviloza – concessionaire of Port of Vidin - south
29. https://www.mtitc.government.bg/bg/transport/politiki/nacionalni-politiki/integrirana-transportna-strategiya-v-perioda-do-2030-g – Integrated transport strategy for the period till 2030
30. https://www.mtitc.government.bg/bg/transport/politiki/nacionalni-politiki/strategiya-za-razvitie-na-transportnata-sistema-na-republika-bulgariya-do-2020-g - Strategy for development of the transport system of the Republic of Bulgaria until 2020
31. https://www.ruse-bg.eu/uploads/files/Strategii%20i%20Otcheti/%D0%9E%D0%9F%D0%A0_%D0%9D%D0%90_%D0%9E%D0%91%D0%A9%D0%98%D0%9D%D0%90_%D0%A0%

D0%A3%D0%A1%D0%95_2014-2020.pdf – Integrated plan for development of Ruse municipality for the period 2014 - 2020
32. *Investment profile for Giurgiu-Ruse Euroregion*, deliverable of the project *Operations in the Ruse-Giurgiu Euroregion - integrated management opportunities through Masterplan*, 2012, www.primariagiurgiu.ro (in Romanian language)
33. *Law of piers safety no. 259/2010* (in Romanian language)
34. Letter of 05.07.2017 from Octopod – C Ltd. – concessionaire of Port of Somovit
35. Letter of 05.07.2017 from Slanchev Dar JSCo. – concessionaire of Port terminal Oryahovo
36. *List of deposits of seeds*, National Sanitary Veterinary and Food Safety Authority, Giurgiu Office, 17.01.2017 (in Romanian language)
37. *Local development strategy of Giurgiu Municipality 2014-2020*, www.primariagiurgiu.ro (in Romanian language)
38. Master Plan Port of Constanta, Final report, December 2015 (updated to December 2016), Ernst & Young SRL - INROS LACKNER SE
39. *Methodology for assessment of safety status in exploitation of dams and piers used for industrial waste deposits - NTLH - 023*, approved by the Joint Order of the Minister of Waters and Environmental Protection no. 116 of 11.02.2002 and of the Minister of Public Works, Transport and Housing no. 289 of 06.03.2002 (in Romanian language)
40. *Municipality Development Strategy for the period 2014-2020*, Drobeta Turnu-Severin, 2015, www.primariadrobeta.ro (in Romanian language)
41. Pâslaru Sorin, *The proof that infrastructure contributes decisively to economic growth*, in Ziarul Fianciar, www.zf.ro, 6 March 2017 (in Romanian language)
42. *Pole of growth Craiova, Integrated Urban Development Strategy*, consultative version, June 2017, www.primariacraiova.ro (in Romanian language)
43. *Port of Vukovar Port Development Concept – Vol. 2: Concept of logististics*, by Ing, MHC, Duisport and ABX Logistics, 2004.
44. *Port Reform Toolkit*, World Bank, 2007.
45. *Portfolio of projects at the South-West Oltenia region 2014-2020*, www.adroltenia.ro (in Romanian language)
46. *Regulation no. 1315/2013 of the European Parliament and of the Council on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU*
47. *Report for the year 2016 on the evaluation of performances of autonomous regies and of companies in which the state holds a majority or full participation, which operates under the authority of the Ministry of Transport*, Ministry of Transport, May 2017 (in Romanian language)
48. *Report on technical and operational status quo analysis,* 212-EU-18089-S –"High Performance Green Port Giurgiu" Project, Version 0.1 Final, 11th June 2014

49. *Report on the potential of the port and its capacity for the future,* 212-EU-18089-S – "High Performance Green Port Giurgiu" Project, Version 0.1 Final, 23rd February 2015
50. *Rhine-Danube Core Network Corridor Study,* iC consulenten, via donau, Panteia, Hacon, 2015.
51. *Romania - The National Competitiveness Strategy*, 2014-2020, București, 2014, www.minind.ro (in Romanian language)
52. *Socio-economic analysis of the South Muntenia Region, February 2013,* www.adrmuntenia.ro (in Romanian language)
53. Socio-economic development strategy of Giurgiu County, Agora Est Consulting S.R.L., February 2014, www.cjgiurgiu.ro (in Romanian language)
54. *South East Region Development Plan 2014-2020*, 2014, www.adrse.ro (in Romanian language)
55. *South Muntenia Region Development Plan 2014-2020*, March 2015, www.adrmuntenia.ro (in Romanian language)
56. *South-West Oltenia Region Development Plan 2014-2020*, www.adroltenia.ro (in Romanian language)
57. *Study on Urban Development in the South-East Region, Current Situation and Development Opportunities*, Agora Est Consulting, www.adrse.ro (in Romanian language)
58. *The Mayor of Giurgiu activity reports*, 2014-2016, www.primariagiurgiu.ro (in Romanian language)
59. The Municipality of Reșița - *Development Strategy for the Period 2014-2020*, BEST-TEHNOLOGY S.R.L., 2014, www.primaria-resita.ro (in Romanian language)
60. *The Regulation on the management of emergency situations caused by floods, dangerous meteorological phenomena, hydrotechnical accident and accidental pollution*, approved by Environmental Ministry Order no. 420/11.05.2006 (in Romanian language)
61. *Traffic reports*, 2007-2016, N.C. Administration of Danube River Ports J.S.Co. Giurgiu 2014 (in Romanian language).
62. tutrakan.egov.bg – web site of the Tutrakan Minicipality
63. *Urban Mobility Plan Sustainable Growth Pole Constanta*, Final report, Parsons Brinckerhoff, November 2015.
64. www.appd-bg.org – web site of the Agency for maintenance and exploration of the Danube River
65. www.brp.bg – web site of the Bulgarian River Shipping company – concessionaire of Port of Vidin-north and Ferryboat terminal Nikopol
66. www.hafen-wien.com
67. www.port-ruse-bg.com – web site of Port Complex Ruse JSCo.

Annexes

Annex I – Port infrastructure data records

Ports: Enns – Novi Sad

PORTS	Enns	Vienna	Bratislava	Komarno	Komarom	Budapest	Slavonski Brod	Vukovar	Novi Sad
Infrastructure assets									
Port land owner (State, Region, Municipality, Private, Other)	region+private	Municipality of Vienna	State	State	private Port Danube Ltd.	state-owned MAHART Freeport Plc.	State	State owned/Privately owned	State
Port infrastructure (quays, basins, berths, etc.) owner (State, Region, Municipality, Private, Other)	port company/region-owned	Municipality of Vienna	Private	Private	private Port Danube Ltd.	state-owned MAHART Freeport Plc.	State	State owned/Privately owned	State/Private
Port authority (port governance, port administration)	public owned company	Wiener Hafen GmbH & Co KG	Verejné prístavy, a.s. (port administration)	Verejné prístavy, a.s. (port administration)	private MAHART Passnave Ltd. Water Team Ltd.	Freeport of Budapest Logistics Ltd.	Port Authority Slavonski Brod	Port Authority	Port Governance
Port operator (Public/Private/Mixed)	public	Public and private	Private	Private	private MAHART Passnave Ltd. Water Team Ltd.	private	Port Authority Slavonski Brod	State owned company/Privately owned company	Public + Private
Port authority name	Ennshafen OÖ GmbH (+NÖ GmbH)	Wiener Hafen GmbH & Co KG	Verejné prístavy, a.s.	Verejné prístavy, a.s.	Port Danube Ltd.	Freeport of Budapest Logistics Ltd.	Port Authority Slavonski Brod	Port Authority Vukovar	Port Governance Agency
Port authority separated from port operator(s) (Yes/No)	yes	Partly	YES	YES	Yes	Yes	No	Yes	Yes
Number of operators (concessionaires, lessors)	9	3	1	1	2	7	1 concessionaire	4	Two (2)
Total port area (ha)	110+242	350	156,68	20,12	2,5	152	90 ha	approx. 26 ha	24,19 ha
Free space for development within the port area (ha)	50	No data available	95	5,4	n/a	42	27 ha	N/A	/
Open shore port (Yes/No)	Yes	No	YES	YES	Yes	Yes	Yes	Yes	No
Basin type port (Yes/No)	Yes	Yes	YES	YES	No	Yes	No	No	Yes (canal)
Number of basins	2	3	4	2	0	3	n/a	N/A	1
Maximum draught (m) - natural or dredged	2,7 m (guaranteed/RNW)	2,7	9,0	7,0	2,5	2,5	2,5	2,6	4 m dredged

PORTS	Enns	Vienna	Bratislava	Komarno	Komarom	Budapest	Slavonski Brod	Vukovar	Novi Sad
Cargo handling capacity (tons/year)	10.000.000	12.000.000	8.000.000	2.100.000	150.000	1.000.000	1.500.000*	2.000.000	2.000.000
Throughput capacity in TEU/year	400.000	450.000	1.400	0	n/a	193.010	10.000*	N/A	/
Port service time (hours per week)	7/24 = 168	42	112,0	84,0	168	168	n/a	105,0	98,0
Total number of terminals	7	No data available	10	2	4	18	3+2*+1**	7	2
Number of bulk terminals	4	No data available	4	2	2	18	1	2	0
Number of break-bulk (general cargo) terminals	4	No data available	4	2	0	4	n/a	1	0
Number of oil/chemical/gas terminals	1	1	1	1	0	2	1	2	1
Number of Ro-Ro terminals	0	1	1	0	0	1	n/a	0	0
Number of Ro-Ro ramps	1	2	1	0	0	1	n/a	0	0
Number of quay-side container terminals with no rail access	0	0	3	0	0	6	n/a	1	0
Number of rail-road bi-modal terminals within the port area	0	0	0	0	0	12	n/a	0	0
Number of tri-modal terminals (with water, rail and road access)	1	1	0	0	0	12	1 + 2*	4	1
Number of multipurpose terminals	4	No data available	0	0	0	18		1	1
Number of other (specialized) terminals	0	No data available	1	0	0	1	1**	0	0
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes	Yes	YES	NO	No	Yes	No	YES	Yes

PORTS	Enns	Vienna	Bratislava	Komarno	Komarom	Budapest	Slavonski Brod	Vukovar	Novi Sad
Ability to handle full block train along the quay (Yes/No)	Yes	Yes	YES	YES	No	Yes	Yes*	NO	Yes
Ability to handle full block train in the port area (Yes/No)	Yes	Yes	YES	YES	No	Yes	Yes*	NO	Yes
Transhipment equipment for intermodal transport (Yes/No)	Yes	Yes	YES	YES	Yes	Yes	No	YES	Yes
Total quay length (vertical + sloped) (m)	3850	18100 (Only 5000 m of operational quay)	8.455	5445	934	4850	120	850	800
Vertical quay length (m)	3.850	10.500	3.138	1.112	70	1650	120	260	170
Sloped quay length (m)	0	7.600	5.317	4.333	864	3200	0	1000	630
Undeveloped quay length (m)	1.900	0	615	0		1000	230 m	Approx. 400m	0
Max number of vessels handled at the same time	16	No data available	No data available	No data available	2	8	up to 6	7	7
Max capacity of anchorage or waiting area for barges (number)	34	80	84	50	n/a	6	3	-	30
Mooring/Anchorage area capacity (m2)	42.000	No data available	23.028	25.472	n/a	68.000	64.920	114.000	No data available
Mooring/Anchorage for dangerous cargo vessels (Yes/No)	Yes	Yes	YES	YES	No	Yes	No	-	Yes
Waterway connection (CEMT class, for seaports only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Number of road entrances (road gates) to port	6	4	3	3	2	3	4(existing)+3 **	3	3
Number of road lanes from/to each road entrance	12	8	3	3	2	3	8(existing) + 6**	6	6

PORTS	Enns	Vienna	Bratislava	Komarno	Komarom	Budapest	Slavonski Brod	Vukovar	Novi Sad
Number of rail entrances (rail gates) to port	2	3	1	1	0	1	2	1	1
Number of rail tracks from/to each rail entrance	2	3	1	1	0	1	1	1	1
Length of rail tracks along the quay walls (m)	2500	4550	No data available	No data available	0	3200	120(existing) + 610*	approx 800m	700
Total length of rail tracks within the port area (m)	17000	No data available	No data available	No data available	0	17000	1.737 (existing) + 1.300*	approx 3000 m	6000
Storage capacity (m2)	n.a.	200000 open + 70000 covered	No data available	No data available	0	141920	270.000	13000	open 100000 covered 44000
Storage capacity for liquid cargos (m3)	3000 (LPG) + 6000 (biodiesels+biooils)	No data available	No data available	No data available	0	n/a	12.000**	10000	270000
Storage capacity (TEU)	8000	8000	1400	0	0	80000	15.000*	N/A	/
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	600	10000	No data available	No data available	0	500	n/a	N/A	/
Bunkering facilities within the port area (Yes/No)	Yes	No data available	Yes	Yes	No	Yes	n/a	YES	Yes
Type of bunkering facility (terminal, tank, mobile container, bunker vessel/barge, other)	vessel/barge	No data available	terminal	terminal	No	terminal, tank, mobile container, bunker vessel/barge	n/a	Bunker vessel /barge	terminal
Availability of clean fuels (LNG, etc.) (Yes/No/Planned)	yes (trucks) + planned (vessels)	No	No / Planned	No	No	Planned	Planned	NO	No
Shore-side power supply for vessels (Yes/No)	Yes	No	YES	YES	No	Yes	No	Yes	Yes
Waste reception facilities (Yes/No)	Yes	Yes	YES	YES	No	No	Planned	YES	No
Used oil collection facilities (Yes/No)	No	No data available	NO	NO	No	No	Planned	YES	No

PORTS	Enns	Vienna	Bratislava	Komarno	Komarom	Budapest	Slavonski Brod	Vukovar	Novi Sad
Surface pavement & drainage (yes/no/planned)	yes+planned (enlargement)	No data available	NO	NO	Yes	Yes	No	No data available	Yes
Precipitation water pretreatment for port area (yes/no/planned)	yes+planned (enlargement)	No data available	NO	NO	No	Yes	No	No data available	No
Other special eco-friendly equiment (yes/no/planned)	fix installed oil barrier, noise barrier, 3 electric gantry cranes, noise reduced reachstaker, anti-dust walls	No data available	NO	NO	No	No	No	No data available	No

Ports: Belgrade - Constanta

PORTS	Belgrade	Lom	Ruse	Vidin	Drobeta TS	Giurgiu	Galati	Braila	Tulcea	Constanta
Infrastructure assets										
Port land owner (State, Region, Municipality, Private, Other)	State	State	State	State	State	State	State	State	State	State
Port infrastructure (quays, basins, berths, etc.) owner (State, Region, Municipality, Private, Other)	Private	State	State	State	State	State	State	State	State	state
Port authority (port governance, port administration)	Port Governance	Publicly owned bodies	Publicly owned bodies	Publicly owned bodies	Joint-stock company (80% Romanian state, 20% Proprietatea Fund)	Joint-stock company (80% Romanian state, 20% Proprietatea Fund)	Port administration	Port Administration	Port Administration	Joint-stock company (80% Romanian state, 20% Proprietatea Fund)

PORTS	Belgrade	Lom	Ruse	Vidin	Drobeta TS	Giurgiu	Galati	Braila	Tulcea	Constanta
Port operator (Public/Private/Mixed)	Private	Private	2 Public and 3 private companies	Private	private	private	Private	PRIVATE	PRIVATE	private
Port authority name	Port Governance Agency	EA Maritime Administration, BPICo	EA Maritime Administration, BPICo	EA Maritime Administration, BPICo	N.C. Administration of Danube River Ports J.S.Co. Giurgiu	N.C. Administration of Danube River Ports J.S.Co. Giurgiu	CN APDM SA GALATI (National Company Maritime Danube Ports Administration Galati)	CN APDM SA GALATI (National Company Maritime Danube Ports Administration Galati)	CN APDM SA GALATI (National Company Maritime Danube Ports Administration Galati)	N.C. Maritime Ports Administration J.S.Co. Constanta
Port authority separated from port operator(s) (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	YES	YES	Yes
Number of operators (concessionaires, lessors)	One (1)	2	5	2	3	3	8	5	1	37
Total port area (ha)	~ 90 ha	38,34	131,20	16,65	13.90	219,54	86 ha 4131 sqm	39 ha 8630 sqm	8 ha2762 sqm	1313
Free space for development within the port area (ha)	/	8	32	4	0.27	N/A	1,062	1,011	3,502	651
Open shore port (Yes/No)	No	Yes	Yes	Yes	Yes	Partly	YES	YES	YES	No
Basin type port (Yes/No)	Yes	Yes	Yes	No	No	Yes	YES	YES	NO	Yes
Number of basins	1	1	2	0	N/A	2	2	1	0	2
Maximum draught (m) - natural or dredged	4 m dredged	2,50 dredged	2,50 dredged	2,50 dredged	2,5	3,5	7.32 m	7.32 m	7.32 m	17,5
Cargo handling capacity (tons/year)	3.000.000	3.500.000	8.130.000	1.000.000	500.000	2.500.000	55.000	2530304	1985000	120.000.000
Throughput capacity in TEU/year	12.000	n/a	50.000	n/a	0	146.000	30.000	-	-	1.500.000
Port service time (hours per week)	68,0	84,0	84,0	84,0	56,0	56,0	24 hour a day 7 day per week	24 hour a day 7 day per weel	24 hour a day 7 day per weel	56,0

PORTS	Belgrade	Lom	Ruse	Vidin	Drobeta TS	Giurgiu	Galati	Braila	Tulcea	Constanta
Total number of terminals	1	2	6	3	3	8	4	1	1	21
Number of bulk terminals	0	All terminals are multipurpose terminals	All terminals are multipurpose terminals	All terminals are multipurpose terminals	1	6	1	1	1	10
Number of break-bulk (general cargo) terminals	0	All terminals are multipurpose terminals	All terminals are multipurpose terminals	All terminals are multipurpose terminals	1	1	1	0	0	8
Number of oil/chemical/gas terminals	0	0	0	0	1	1	1	0	0	4
Number of Ro-Ro terminals	0	1	2	1	0	0	ON GOING	0	0	2
Number of Ro-Ro ramps	0	1	2	1	0	0	n/a	0	0	2
Number of quay-side container terminals with no rail access	0	0	0	0	0	0	n/a	0	0	0
Number of rail-road bi-modal terminals within the port area	0	1	3	1	0	0	n/a	0	0	0
Number of tri-modal terminals (with water, rail and road access)	1	1	3	1	0	0	4	0	0	5
Number of multipurpose terminals	1	2	5	2	1	1	3	1	1	8
Number of other (specialized) terminals	0	0	0	0	0	0	1	0	0	1
Heavy lift and out-of-gauge handling capacity (Yes/No)	Yes	No	Yes	No	No	No	YES	YES	YES	Yes
Ability to handle full block train along the quay (Yes/No)	Yes	No	No	No	No	No	YES	YES	NO	Yes
Ability to handle full block train in the port area (Yes/No)	Yes	Yes	Yes	No	No	No	YES	YES	YES	Yes

PORTS	Belgrade	Lom	Ruse	Vidin	Drobeta TS	Giurgiu	Galati	Braila	Tulcea	Constanta
Transhipment equipment for intermodal transport (Yes/No)	Yes	No	Yes	No	No	Yes	YES	YES	YES	Yes
Total quay length (vertical + sloped) (m)	940	1556	4492	500	1156	2120	7.065	3.303	2.555	29830
Vertical quay length (m)	610	970	1.075	60	365	170	4.675	797	330	29.830
Sloped quay length (m)	330	586	3.417	440	791	1.950	2.390	2.506	2.225	0
Undeveloped quay length (m)	0		500	200	1.250	850	620	100	0	3.262
Max number of vessels handled at the same time	8	15	37	7	3	8	2	2	2	96
Max capacity of anchorage or waiting area for barges (number)	12	5 anchorages	19 anchorages	5 anchorages	20	35	2	18	18	150
Mooring/Anchorage area capacity (m2)	No data available	No data available	No data available	No data available	17.000	30.000	No data available	n/a	n/a	63.000
Mooring/Anchorage for dangerous cargo vessels (Yes/No)	No	yes	yes	yes	No	No	YES	YES	YES	Yes
Waterway connection (CEMT class, for seaports only)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	VIc
Number of road entrances (road gates) to port	3	3	8	3	2	1	6	2	1	10
Number of road lanes from/to each road entrance	6	2	2	2	1	1	2	2	2	25
Number of rail entrances (rail gates) to port	1	1	3	1	1	1	4	2	1	6
Number of rail tracks from/to each rail entrance	1	2	2	2	1	1	1	2	1	9
Length of rail tracks along the quay walls (m)	940		2700	380	365	200	11458	600	0	19873,63

PORTS	Belgrade	Lom	Ruse	Vidin	Drobeta TS	Giurgiu	Galati	Braila	Tulcea	Constanta
Total length of rail tracks within the port area (m)	12500	7176	8759	1232	365	1400	12348	1481	320	300000
Storage capacity (m2)	open 600000 covered 200000	131.626	286.075	31.000	13725	40000	504.465	261154	7000	3898325
Storage capacity for liquid cargos (m3)	0	188	0	0	N/A	7000	1,323,200 TO	5000 TO	–	1700000
Storage capacity (TEU)	12000 m2	n/a	15000	n/a	N/A	N/A		–	–	16000
Storage capacity (CEU - car equivalent unit, for Ro-Ro terminals)	/	n/a	160 TIR	No	N/A	N/A	n/a	n/a	n/a	6600
Bunkering facilities within the port area (Yes/No)	No	No	No	No	No	Yes	YES	YES	YES	Yes
Type of bunkering facility (terminal, tank, mobile container, bunker vessel/barge, other)	No	-	-	-	N/A	auto, terminal	Terminal, Tank, Mobile container	Tank, Container	NO	tank, terminal, auto
Availability of clean fuels (LNG, etc.) (Yes/No/Planned)	No	No	No	No	No	No	Planned	NO	YES	Planned
Shore-side power supply for vessels (Yes/No)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	YES	YES	Yes
Waste reception facilities (Yes/No)	Yes	No	No	No	Yes	Yes	Yes	YES	YES	Yes
Used oil collection facilities (Yes/No)	Yes	No	No	No	Yes	Yes	Yes	YES	YES	Yes
Surface pavement & drainage (yes/no/planned)	Yes	Yes	Yes	Yes	No	No	No data available	NO	NO	Yes
Precipitation water pretreatment for port area (yes/no/planned)	No	No	No	No	No	No	No data available	NO	NO	Yes
Other special eco-friendly equiment (yes/no/planned)	No	No	No	No	No	No	No data available	NO	NO	Yes

Annex II – Port transshipment statistics

Port of Enns cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	258,756	119,304	101,941	113,426	134,833	148,499	177,893	179,016	168,618	135,047
02	Coal and lignite; crude petroleum and natural gas	0	0	0	0	0	0	0	0	0	0
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	225,805	135,286	167,453	238,632	264,720	199,128	261,906	289,739	319,967	291,523
04	Food products, beverages and tobacco	205,349	200,385	197,209	216,518	182,961	216,754	223,677	199,970	217,727	176,151
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	29,566	43,331	27,017	22,163	27,014	13,394	20,811	17,004	11,157	23,357
07	Coke and refined petroleum products	3,551	6,653	12,179	13,527	13,952	5,475	6,542	4,612	2,286	3,823
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	0	0
09	Other non-metallic mineral products	0	0	0	0	0	0	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	96,788	91,038	80,204	98,697	45,423	55,258	94,972	97,819	62,742	37,602
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	139	781	2,398	2,053	962	1,180	601	572	892	1,420
12	Transport equipment	170	0	0	0	80	85	0	0	63	50
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	90	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	250	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	1,983	4,112	3,310	610	770	6,114	19,907	37,157	28,169	34,050
20	Other goods n.e.c.	0	0	0	0	0	0	0	0	0	0
∑	Grand totals	822,447	600,890	591,711	705,626	670,715	645,887	806,309	825,889	811,621	703,023

Interreg
Danube Transnational Programme
DAPhNE

Port of Vienna cargo statistics 2007 – 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	0	0	0	0	0	0	73,472
02	Coal and lignite; crude petroleum and natural gas	0	0	0	0	0	0	0	0	0	759,832
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	0	0	0	0	0	0	17,743
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	0	0
09	Other non metallic mineral products	0	0	0	0	0	0	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	0	0	0	0	0	0	0	95,367
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	1,342
20	**Other goods n.e.c.**	0	0	0	0	0	0	0	0	0	221
∑	**Grand totals**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**947,977**

Port of Bratislava cargo statistics 2007 – 2016 (tons)

	Year Type of goods (NST 2007 Classification)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	6,387	9,658	2,499	6,237	11,363	1,973	5,016
02	Coal and lignite; crude petroleum and natural gas	0	0	0	14,934	0	0	4,337	843	0	13,706
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	652,281	653,546	560,864	534,737	491,042	502,966	478,132
04	Food products, beverages and tobacco	0	0	0	802	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	0	0	0	1,034,562	734,502	607,371	690,968	509,975	667,193	526,368
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	171,828	157,352	143,752	155,656	116,159	117,229	121,100
09	Other non metallic mineral products	0	0	0	0	1,010	0	0	0	0	269
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	0	840,036	769,576	677,696	669,783	566,615	709,214	815,292
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	4,641	4,640	15,127	5,624	5,757	3,148	5,569
12	Transport equipment	0	0	0	0	692	0	0	0	1,204	665
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	15,493	13,898	0	7,498	13,720	4,076	1,114
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	4,586	5,088	5,355	3,391	2,702	2,075	2,922

	Year										
	Type of goods (NST 2007 Classification)	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
∑	**Grand totals (tons)**	**0**	**0**	**0**	**2,745,550**	**2,349,962**	**2,012,664**	**2,078,231**	**1,718,176**	**2,009,078**	**1,970,153**

Port of Komarno cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	75,235	30,167	12,580	11,831	7,958	8,419	2,001	10,230	93,761	131,650
02	Coal and lignite; crude petroleum and natural gas	68,042	201,877	367,802	370,128	148,823	105,510	3,641	494	594	2,413
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	13,641	1,684	3,804	33,782	21,520	23,597	62,988	26,627	11,804	13,883
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	383	189	0	0	0	0	0	0	0
07	Coke and refined petroleum products	151,741	163,736	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	17,503	23,688	9,435	9,617	3,234	0	0	0	0	0
09	Other non metallic mineral products	0	0	0	0	0	0	0	1,876	1,876	0
10	Basic metals; fabricated metal products, except machinery and equipment	163,916	27,671	19,289	30,307	18,008	11,031	17,666	24,056	0	102
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	90	373	239	79	29	0	199	0	97	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	902	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	0	0	0	0	0	0	0	0	0	0
∑	Grand totals	490,168	449,579	413,338	455,744	199,572	148,557	86,495	63,283	109,034	148,048

Port of Komarom cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	0	0	0	0	0	0	23,610
02	Coal and lignite; crude petroleum and natural gas	0	0	0	0	0	0	0	0	0	0
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	0	0	0	0	0	0	36,659
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	0	0
09	Other non metallic mineral products	0	0	0	0	0	0	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	0	0	0	0	0	0	0	0
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
∑∑	**Grand totals**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**60,269**

Interreg
Danube Transnational Programme
DAPhNE

Port of Budapest cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	318,250	297,841	163,650	206,327	269,380	226,611	323,176	306,691
02	Coal and lignite; crude petroleum and natural gas	0	0	395,334	475,442	301,648	266,683	268,359	291,979	350,719	488,000
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	0	0	0	0	0	0	0
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	4,210	8,788	21,740	40,224	57,512	42,153	44,882	89,905
09	Other non metallic mineral products	0	0	0	0	0	0	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	51,329	80,884	101,173	58,442	103,007	87,722	77,360	53,501
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	21,472	20,974	16,790	18,537	16,569	16,991	16,667	15,955
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	31,336	82,399	61,732	36,219	79,075	61,644	28,418	42,513

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	450	3,917	12,821	4,366	1,692	5,230	4,698	9,464
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	0	0	28	32,000	274	900	2,241	0	0	32,624
∑	**Grand totals**	**0**	**0**	**822,410**	**1,002,246**	**679,828**	**631,698**	**797,834**	**732,330**	**845,919**	**1,038,653**

Port of Slavonski Brod cargo statistics 2007 - 2016 (tons)

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
01	**Products of agriculture, hunting, and forestry; fish and other fishing products**	0	0	0	0	0	0	0	0	0	0
02	**Coal and lignite; crude petroleum and natural gas**	180,000	136,000	126,000	124,074	85,034	46,267	38,468	50,683	53,901	77,642
03	**Metal ores and other mining and quarrying products; peat; uranium and thorium**	1,807,932	1,733,312	524,413	235,515	203,768	140,553	74,643	60,380	109,620	120,170
04	**Food products, beverages and tobacco**	0	0	0	0	0	0	0	0	0	0
05	**Textiles and textile products; leather and leather products**	0	0	0	0	0	0	0	0	0	0
06	**Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;**	0	0	0	0	0	0	0	0	0	0
07	**Coke and refined petroleum products**	0	0	0	0	0	0	0	0	0	0
08	**Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel**	0	0	0	0	0	0	0	0	0	0
09	**Other non metallic mineral products**	0	0	0	0	0	0	0	0	0	0
10	**Basic metals; fabricated metal products, except machinery and equipment**	0	0	0	1,873	369	0	812	0	949	0
11	**Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks**	0	0	0	0	0	0	0	0	0	0
12	**Transport equipment**	0	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	0	0	0	0	0	0	0	0	0	0
∑	Grand totals	1,987,932	1,869,312	650,413	361,462	289,171	186,820	113,923	111,063	164,470	197,812

Port of Vukovar cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	103,166	46,627	33,570	14,557	36,129	32,450	110,846	81,766	125,223	78,857
02	Coal and lignite; crude petroleum and natural gas	42,927	39,751	7,052	12,833	36,163	0	0	12,434	0	12,130
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	488,823	107,740	65,054	160,083	169,486	277,662	241,717	195,917	265,285	142,014
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	48,914	0	0	2,983	0	28,111	17,363	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	8,905	25,174	18,520	16,831	18,818	25,034	8,322	11,053	12,243	11,184
09	Other non metallic mineral products	72,634	123,834	18,851	2,392	7,698	5,345	2,260	0	8,266	55,634
10	Basic metals; fabricated metal products, except machinery and equipment	110,810	115,697	12,917	3,958	45,410	81,264	44,148	20,926	12,982	32,360
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	1,567	2,525	497	4,868	313	1,063	2,370	3,186	305	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
15	**Mail, parcels**	0	0	0	0	0	0	0	0	0	0
16	**Equipment and material utilized in the transport of goods**	0	0	0	0	0	0	0	0	0	0
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	0	0	0	0	0	0	0	1,572	0	762
∑	**Grand totals**	**877,746**	**461,348**	**156,461**	**218,505**	**314,017**	**450,929**	**427,026**	**326,854**	**424,304**	**332,941**

Port of Novi Sad cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	492,749	399,543	722,167	443,459	751,682	833,551	800,749
02	Coal and lignite; crude petroleum and natural gas	0	0	0	0	3,072	2,027	0	0	0	964
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	1,607	1,753	1,355	9,835	10,261	19,820	0
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	0	0	0	0	0	0	0
07	Coke and refined petroleum products	0	0	0	121	1,994	3,976	275,578	249,364	240,219	234,990
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	128,652	127,195	271,243	225,426	183,297	133,312	363,221
09	Other non metallic mineral products	0	0	0	0	1,425	1,213	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	0	2,526	20,943	65,817	16,871	8,499	3,539	8,143
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	0	0	0	0	30	0	2	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	9,659	6,880	32,024	43,991	30,526	10,949	6,796

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	0	0	0	0	0	0	0	0	0	0
∑	Grand totals	0	0	0	635,313	562,807	1,099,821	1,015,190	1,233,628	1,241,391	1,414,863

Interreg Danube Transnational Programme DAPhNE

Port of Belgrade cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	0	0	0	0	0	0	0
02	Coal and lignite; crude petroleum and natural gas	20,000	13,000	10,000	24,000	17,000	30,000	9,384	12,490	10,550	14,393
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	63,000	78,000	79,100	85,200	66,200	69,500	78,777	91,804	139,137	132,077
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	12,000	7,000	7,000	8,500	5,500	2,000	0	0	0	0
07	Coke and refined petroleum products	0	0	0	0	0	0	44	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	2,000	6,000	6,000	10,000	10,000	15,500	6,411	0	28,644	13,107
09	Other non metallic mineral products	48,000	19,000	2,400	4,500	0	0	2,753	1,698	0	1,461
10	Basic metals; fabricated metal products, except machinery and equipment	150,000	97,000	34,500	20,100	15,700	15,000	30,760	27,950	31,083	16,191
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	2,000	1,000	500	200	100	500	91	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	1,000	3,000	16,300	12,200	12,200	37,000	66,379	35,135	26,251	23,202

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	30,000	24,000	10,200	7,500	8,100	3,500	240	120	483	0
20	Other goods n.e.c.	0	0	0	0	0	0	0	0	0	0
∑	Grand totals	328,000	248,000	166,000	172,200	134,800	173,000	194,839	169,197	236,148	200,431

Interreg Danube Transnational Programme DAPhNE

Port of Lom cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	125,713	240,830	153,302	0	262,838	390,642	292,685	216,234
02	Coal and lignite; crude petroleum and natural gas	0	0	166,480	149,462	152,277	0	108,488	95,057	123,712	72,797
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	75,011	67,965	32,786	0	18,224	40,140	19,450	52,403
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	1,300	6,372	0	0	1,488	575	0
07	Coke and refined petroleum products	0	0	5,069	3,601	9,277	0	7,881	10,241	7,415	14,028
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	10,280	26,204	27,822	0	73,280	54,183	46,043	49,677
09	Other non metallic mineral products	0	0	5,886	4,596	4,339	0	0	0	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	39,107	32,873	16,521	0	16,664	41,888	135,407	150,184
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	814	504	1,060	0	118	18	43	0
12	Transport equipment	0	0	15	13	1	0	4	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	2,922	1,277	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	1,343,237	802,444	0	0	0	502,543	0	0	0	0
∑	Grand totals	1,343,237	802,444	428,375	527,347	403,756	502,543	487,497	636,578	626,607	555,323

Port of Ruse cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	177,106	254,192	272,866	428,218	359,237	228,496	319,738	573,479	496,159	509,728
02	Coal and lignite; crude petroleum and natural gas	718,669	905,111	618,386	467,368	452,229	437,700	311,935	393,027	281,105	242,709
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	619,772	526,132	409,289	247,334	527,542	293,782	246,212	324,176	396,559	201,613
04	Food products, beverages and tobacco	11,885	15,018	636	0	0	0	1,056	0	2,960	3,311
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	21
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	19,977	31,146	13,720	18,191	42,439	9,480	11,244	15,545	17,368	757
07	Coke and refined petroleum products	87,019	91,851	66,674	91,686	71,174	61,449	60,690	52,414	49,613	38,821
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	22,093	42,407	90,846	97,147	100,202	98,354	85,150	47,708	94,996	60,093
09	Other non metallic mineral products	72,512	30,850	21,390	24,132	33,168	31,811	122,416	43,451	30,786	50,326

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
10	Basic metals; fabricated metal products, except machinery and equipment	465,104	350,583	119,702	92,873	155,198	90,211	69,225	69,768	59,563	102,068
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	14,936	22,575	23,067	16,680	23,763	20,047	19,811	15,047	17,890	12,572
12	Transport equipment	17,171	17,233	3,569	9,464	105,265	7,291	83,244	4,278	4,305	3,878
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	49	0	0	0	0	6,763	3,925
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	306	109	138	216	439	19	42	3,832	77,978	92,087
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor	2	3	0	0	6	1	0	0	0	25

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	vehicles being moved for repair; other non market goods n.e.c.										
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	20	1,825	1	0	27,446	0	0	0	881	998
20	Other goods n.e.c.	30,000	121,713	1,491	6,928	4,461	268,655	190,656	381,242	320,250	543,718
∑	Grand totals	2,256,572	2,410,747	1,641,774	1,500,287	1,902,569	1,547,294	1,521,418	1,923,966	1,857,175	1,866,651

Interreg Danube Transnational Programme DAPhNE

Port of Vidin cargo statistics 2007 - 2016 (tons)

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	0	0	0	2,308	15,275	0	37,553	34,987	19,162	19,635
02	Coal and lignite; crude petroleum and natural gas	0	0	260,298	194,987	142,423	0	175,109	120,203	82,193	3,450
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	0	0	0	0	790	0	0	3,571	0	0
04	Food products, beverages and tobacco	0	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	0	0	0	23,010	0	0	1,956	11,907	1,639	780
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	662	2,009
09	Other non metallic mineral products	0	0	0	10,508	0	0	8,456	17,382	3,938	0
10	Basic metals; fabricated metal products, except machinery and equipment	0	0	7,970	1,005	0	0	0	0	0	0
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	17	0	11	0	0	2	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	**Mail, parcels**	0	0	0	0	0	0	0	0	0	0
16	**Equipment and material utilized in the transport of goods**	0	0	0	0	0	0	0	346	0	0
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	1	0	0	0	0	0	0	25
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	252,069	269,830	0	0	0	232,741	0	0	0	0
∑	**Grand totals**	**252,069**	**269,830**	**268,286**	**231,818**	**158,499**	**232,741**	**223,074**	**188,399**	**107,594**	**25,899**

Port of Drobeta Turnu Severin cargo statistics 2007 - 2016 (tons)

	Year										
	Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	27,619	40,707	13,975	27,541	26,787	21,681	23,216	26,291	15,568	14,336
02	Coal and lignite; crude petroleum and natural gas	132,402	38,892	4,636	0	0	0	5,158	5,328	0	0
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	81,365	83,730	4,400	110,869	67,030	114,634	25,866	2,617	154,325	24,172
04	Food products, beverages and tobacco	1,611	2,840	0	6,018	4,782	1,816	13,017	0	30,203	1,690
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	123	0	907	4,519	2,047	0	0	0	0	0
07	Coke and refined petroleum products	121,462	158,606	194,695	238,447	326,312	181,437	187,688	119,738	187,688	186,755
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	32,044	0	0	0	0	0	0	0	0	0
09	Other non metallic mineral products	10,484	50,631	15,016	15,570	2,063	5,966	11,997	11,156	0	0
10	Basic metals; fabricated metal products, except machinery and equipment	3,288	7,238	0	22,790	15,028	39,467	68,833	76,611	4,563	33,027
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	0	0	0	0	0	0	0	0	0	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	5,339	249	0	0	1,556	0	248	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	109	0	0	0	0	0	0	0	0	18,653
∑	Grand totals	415,846	382,893	233,629	425,754	445,605	365,001	336,023	241,741	392,347	278,633

Port of Giurgiu cargo statistics 2007 - 2016 (tons)

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
01	**Products of agriculture, hunting, and forestry; fish and other fishing products**	81,470	33,241	55,735	69,448	61,958	55,293	128,348	188,937	108,221	217,037
02	**Coal and lignite; crude petroleum and natural gas**	79,557	22,478	23,946	0	0	409	7,760	6,734	0	6,396
03	**Metal ores and other mining and quarrying products; peat; uranium and thorium**	249,447	218,316	55,719	113,376	67,030	100,202	34,278	61,917	151,736	197,216
04	**Food products, beverages and tobacco**	4,829	2,083	6,262	32,587	8,648	14,819	34,794	28,193	30,203	60,775
05	**Textiles and textile products; leather and leather products**	0	0	0	0	0	0	0	0	0	0
06	**Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;**	397	1,239	0	0	0	0	0	0	0	0
07	**Coke and refined petroleum products**	6	2,286	34,481	17,140	8,087	409	11,081	58,583	123,628	126,644
08	**Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel**	0	0	12,898	15,639	56,649	0	50,618	54,088	75,868	66,296
09	**Other non metallic mineral products**	115,353	205,396	49,996	39,052	20,557	19,146	11,997	11,156	7,060	6,828
10	**Basic metals; fabricated metal products, except machinery and equipment**	0	14,202	11,114	17,140	4,170	39,467	68,836	76,611	118,392	125,897
11	**Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks**	306	315	0	0	0	0	0	0	0	0
12	**Transport equipment**	0	0	0	0	0	0	0	0	0	0
13	**Furniture; other manufactured goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
14	**Secondary raw materials; municipal wastes and other wastes**	0	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
15	Mail, parcels	28,700	38,732	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	55,500	68,781	44,568	15,374	688	328	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.	0	0	0	0	0	0	0	0	0	0
20	Other goods n.e.c.	1,267	865	0	0	0	0	0	0	0	137
∑	Grand totals	561,332	539,153	305,651	373,163	271,667	245,119	348,400	486,547	615,108	807,226

Port of Galati cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	14,591	75,986	49,577	93,621	109,464	119,396	221,404	276,362	0	203,244
02	Coal and lignite; crude petroleum and natural gas	1,643,168	1,528,401	878,609	933,856	78,000	58,015	381,523	525,595	493,785	665,689
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	6,016,805	5,294,846	2,241,069	1,009,936	2,750,302	1,416,897	1,523,168	1,745,271	2,149,613	553,751
04	Food products, beverages and tobacco	54,025	56,902	69,465	92,415	154,015	86,393	190,342	187,618	156,728	176,141
05	Textiles and textile products; leather and leather products	1,138	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	30,996	22,072	14,827	12,271	29,401	31,444	13,049	0	8,604	3,495
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	908	1,600	22,302	1,054	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
09	Other non metallic mineral products	0	0	20,161	0	3,068	0	2,207	0	7,809	2,147
10	Basic metals; fabricated metal products, except machinery and equipment	2,293,106	1,890,508	1,468,185	1,627,938	1,476,582	1,307,085	1,173,623	1,061,445	1,251,505	0
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	2,928	754	1,361	1,042	0	1,144	7,865	889	2,568	679
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0

Danube Transnational Programme
DAPhNE

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	927	595	0	352	0	10,108	2,944	0	0	31
∑	**Grand totals**	**10,058,592**	**8,871,664**	**4,765,556**	**3,772,485**	**4,600,832**	**3,030,482**	**3,516,125**	**3,797,180**	**4,070,612**	**1,605,177**

Port of Braila cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	106,025	178,093	339,977	389,688	294,427	167,232	319,584	409,888	401,262	460,417
02	Coal and lignite; crude petroleum and natural gas	68,405	163,645	77,963	83,706	0	77,039	63,844	73,217	33,779	25,191
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	2,123,063	1,979,945	1,683,730	1,939,274	2,199,313	1,724,418	1,692,230	1,345,867	1,597,846	1,440,898
04	Food products, beverages and tobacco	97,094	112,296	93,188	184,777	186,242	91,422	39,223	18,972	105,916	138,481
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	11,985	389	0	0	29	27,603	46,948	35,304	37,628	15,609
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	0	0
09	Other non metallic mineral products	0	6,819	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
10	Basic metals; fabricated metal products, except machinery and equipment	202,865	154,985	86,635	377,036	300,102	81,745	62,202	37,486	30,636	0
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	373	257	450	0	0	0	44	0	0	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0

	Year / Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
17	**Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.**	0	0	0	0	0	0	0	0	0	0
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	0	250	0	1,747	0	19	437	0	10,285	1,025
∑	**Grand totals**	**2,609,810**	**2,596,679**	**2,281,943**	**2,976,228**	**2,980,113**	**2,169,478**	**2,224,512**	**1,920,734**	**2,217,352**	**2,081,621**

Port of Tulcea cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	6,298	18,374	572	10,763	16,885	18,326	32,609	17,893	5,889	14,997
02	Coal and lignite; crude petroleum and natural gas	115	5,989	6,604	23,442	16,065	9,197	0	0	0	0
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	1,597,112	1,197,161	705,751	2,340,917	1,344,729	2,165,887	2,101,964	1,910,233	2,525,657	2,127,440
04	Food products, beverages and tobacco	6,679	0	0	0	0	0	0	0	0	0
05	Textiles and textile products; leather and leather products	0	0	0	0	0	0	0	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	27,139	23,767	2,097	1,125	18,285	26,117	14,801	14,593	18,301	0
07	Coke and refined petroleum products	0	0	0	0	0	0	0	0	0	0
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	0	0	0	0	0	0	0	0	0	0
09	Other non metallic mineral products	0	1,046	515	2,625	15,919	0	0	7	0	0
10	Basic metals; fabricated metal products, except	57,124	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	machinery and equipment										
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	1	95	14	516	0	0	6	0	0	0
12	Transport equipment	0	0	0	0	0	0	0	0	0	0
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0

	Year										
	Type of goods	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
18	**Grouped goods: a mixture of types of goods which are transported together**	0	0	0	0	0	0	0	0	0	0
19	**Unidentifiable goods: goods which for any reason cannot be identified and therefore cannot be assigned to groups 01-16.**	0	0	0	0	0	0	0	0	0	0
20	**Other goods n.e.c.**	2,298	1,955	1,461	1,169	1,568	0	1,148	0	0	0
∑	**Grand totals**	**1,696,766**	**1,248,387**	**717,014**	**2,380,557**	**1,413,451**	**2,219,527**	**2,150,528**	**1,942,726**	**2,549,847**	**2,142,437**

Interreg
Danube Transnational Programme
DAPhNE

Port of Constanta cargo statistics 2007 - 2016 (tons)

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
01	Products of agriculture, hunting, and forestry; fish and other fishing products	4,351,433	6,823,266	6,762,641	6,776,534	9,595,851	9,604,821	15,341,953	17,438,150	19,683,988	20,492,798
02	Coal and lignite; crude petroleum and natural gas	12,733,598	15,392,315	7,069,703	5,494,445	5,219,632	4,879,790	4,689,244	4,764,203	6,157,564	5,174,596
03	Metal ores and other mining and quarrying products; peat; uranium and thorium	14,328,103	14,475,071	6,042,233	9,901,932	9,574,808	11,688,384	14,070,242	9,827,179	7,995,958	9,013,712
04	Food products, beverages and tobacco	1,198,384	1,564,328	1,870,070	2,128,784	2,458,006	504,608	2,496,012	2,894,340	2,027,780	3,715,082
05	Textiles and textile products; leather and leather products	815	143	1,869	73,482	64,825	172,811	398	0	0	0
06	Wood and products of wood and cork (except furniture); articles of straw and plaiting materials; pulp, paper and paper products;	976,263	83,612	84,343	965,958	949,092	954,354	1,099,285	982,862	920,767	635,190
07	Coke and refined petroleum products	2,844,709	2,719,853	2,387,295	2,821,300	2,215,280	2,534,993	2,112,966	2,279,017	2,593,214	3,104,215
08	Chemicals, chemical products, and man-made fibers; rubber and plastic products ; nuclear fuel	371,902	367,585	243,996	18,652	115,487	131,411	134,144	72,962	108,478	102,331
09	Other non metallic mineral products	4,638,060	1,001	382	356	367	612	398	273	143	173
10	Basic metals; fabricated metal products, except machinery and equipment	3,665,941	2,047,112	1,378,281	1,346,419	2,094,513	1,763,724	1,530,553	1,693,721	1,959,117	1,926,556

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
11	Machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c.; radio, television and communication equipment and apparatus; medical, precision and optical instruments; watches and clocks	110,324	168,136	178,636	238,439	312,956	287,069	331,818	342,937	345,588	340,745
12	Transport equipment	137,000	17,867	243,747	265,858	355,904	369,418	437,955	365,651	363,638	3,568
13	Furniture; other manufactured goods n.e.c.	0	0	0	0	0	0	0	0	0	0
14	Secondary raw materials; municipal wastes and other wastes	0	0	0	0	0	0	0	0	0	0
15	Mail, parcels	0	0	0	0	0	0	0	0	0	0
16	Equipment and material utilized in the transport of goods	0	0	0	0	0	0	0	0	0	0
17	Goods moved in the course of household and office removals; baggage and articles accompanying travellers; motor vehicles being moved for repair; other non market goods n.e.c.	0	0	0	0	0	0	0	0	0	0
18	Grouped goods: a mixture of types of goods which are transported together	0	0	0	0	0	0	0	0	0	0
19	Unidentifiable goods: goods which for any reason cannot be identified and therefore	0	0	0	0	0	0	0	0	0	0

	Year Type of goods	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	cannot be assigned to groups 01-16.										
20	**Other goods n.e.c.**	12,423,368	18,177,411	15,751,004	17,531,741	13,015,374	17,692,667	12,893,089	14,980,615	14,180,537	14,915,855
∑	**Grand totals**	**57,779,900**	**61,837,700**	**42,014,200**	**47,563,900**	**45,972,095**	**50,584,662**	**55,138,057**	**55,641,910**	**56,336,772**	**59,424,821**

Annex III – Port development projects list

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
HU001	PAN-LNG-4-DANUBE	HU	Budapest (Csepel)	The Action will be implemented in Hungary at Csepel-Freeport in the southern part of Budapest, which is part of the inland waterway (IWW) Core Network Corridor Rhine - Danube. The objective of the Action is to accelerate LNG availability for Danube IWW transport at this tri-modal core port by deploying a fixed LNG refuelling station. This station would serve not only LNG propelled vessels but also LNG trucks and possibly trains as well. In addition, the Action foresees to retrofit existing vessels with LNG propulsion. The Action will study the design of the innovative LNG related infrastructure, implement it and will disseminate appropriate related results.	06/2016	09/2019	10.11	On-going
AT001	OPTIHUB	AT	Wien	Based on a case study at the Port of Vienna, a standardised optimization system for multi-modal hubs was developed with new simulation algorithms. It analyses, combines and optimizes significant (administrative, operational and logistic) and innovative processes as well as location-based conditions. New goods with waterway transport affinity are identified to strengthen inland waterway transports.	01/2013	12/2016	0.64	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT002	Studies for the expansion of the trimodal port of Freudenau/Vienna	AT	Wien	In recent years, the increase in container transshipments at the Port of Vienna-Freudenau has caused bottlenecks in terms of cargo handling space. Compared to 2010, container transshipments alone increased by 38% to nearly 442,000 container units (TEU) in 2011. The project consists of studies aiming to plan and design the expanded Port of Vienna Freudenau. The studies specifically look at extending the container handling capacities of the port. The project includes all the necessary steps from preliminary planning to obtaining the building authorisations and publishing the works tenders.	01/2012	12/2015	5.44	Completed
AT003	Expansion of the tri-modal inland port of Vienna by land recovery 2012-AT-18070-P	AT	Wien	Freight handling capacity bottleneck. Extension of the port's container handling capacities through land recovery and the construction of a new quay wall in order to optimise the areas of operation.	01/2012	12/2015	12.79	Completed
AT004	Planning and construction of the expansion of the trimodal Port of Freudenau/Vienna	AT	Wien	Addition to container handling capacities, including handling yards and waterside infrastructure.	01/2015	12/2025	57.00	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT005	Improving of the multimodal interconnections at Port of Freudenau/Vienna	AT	Wien	The Global Project aims at the expansion of the container transshipment capacities at the Port through land reclamation and optimisation of operational areas to increase storage capacity and handling performance. The proposed Action includes activities to optimise the operational areas to increase the storage and transshipment capacities and improve the multimodal interconnections of the container transshipment area at the Port by reorganising the rail track system.	unknown	unknown	9.02	Planned
AT006	Container Terminal Enlargement	AT	Enns	Project was realized and finished (project derived from a PPP-contract in the year 2015)	01/2014	12/2016	20.00	Completed
AT007	Cargo City Enns	AT	Enns	Construction of the new logistics centre by Keindl and connection to the trimodal node of combined transport traffic	01/2015	12/2030	100.00	On-going

Interreg
Danube Transnational Programme
DAPhNE

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT008	Rail connections improvement	AT	Enns	The trimodal port Ennshafen has got very good infrastructure and enough space for growing; the port is dedicated as industrial place; in order to manage the needs in the future decades it is necessary to start strategic planning for the next level in railway connection to the port, which could be needed if modular shift will go the actual way and temporary problems of the IWW will occur due to weather conditions; in this case an backup-line for water transport is necessary and will foster additional in/outbound capacity of the lines	01/2014	12/2016	N/A	Completed
AT009	Quay rehabilitation	AT	Enns	Erection of a transshipment platform (app. 0,8 Mio €); investment started in 2016, to be finished in first half of 2017	01/2016	06/2017	N/A	Completed
AT010	Further development of hinterland connection to economic area	AT	Enns	Study for planning of additional connecting and handling facilities within the port which need the local economic area to increase freight handling at the trimodal port, followed by the investment and construction phase.	01/2015	12/2030	N/A	On-going
AT011	Alternative fuel project	AT	Enns	Masterplan and stepwise investments for LNG-infrastructure in the port and in Upper Austria and the regional catchment area of the port	08/2016	12/2030	N/A	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT012	Feasibility study for the Kai 21	AT	Enns	"Truck-Train-Ship handling-station (TTS)", especially for connection of Adria to Danube (one of the nearest distances is Port of Enns) and special transhipment station in case of problems with navigability of the Danube - especially upstream of Enns) - very urgent, because Straubing-Vilshofen has "no 100 % solution" until 2030 > so the rest of Danube (downstream of Enns) can run well. Studies followed by the implementation phase.	01/2017	12/2030	N/A	On-going
AT013	Masterplan and further stepwise realisation for surface pavement & drainage systems and water pretreatment for total area	AT	Enns	elaboration of a masterplan and preparation of further stepwise realisation for surface pavement & drainage systems (debundling, divestments, separations, new strategic lines and cost estimations; planning for best practice standard for eco-friendly port on the Danube; singular water pre-treatment devices for different areas or collecting system and combined system (incl. pumping, watching, analysing of water parameters, ...)	01/2016	12/2025	N/A	On-going
AT014	Updating of camera system	AT	Enns	completely renewal of old existing camera system for the port; technology-change from analogue to digital; perhaps combination with PCS; safety & security aspects	06/2017	12/2018	0.10	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT014	Enns Multimodal Terminal	AT	Enns	The Action forms part of a Global Project aiming to develop Enns port into a trimodal terminal and to support European deep sea ports by providing a gateway terminal to serve the transit cargo. It is the first phase of the Global Project and aims at modernisation and expansion of the existing port terminal by constructing a high frequency rail container terminal operating three gantry cranes, construction of rail infrastructure, extra container storage areas and a modern docking cross docking system. The Action will contribute to enhancement of the competitiveness of inland waterway transport and will foster the use of more environmentally friendly transport modes.	unknown	04/2015	24.51	Completed
AT015	Port mobile Crane	AT	Wien	Renewal of the port infrastructure by the purchase of a harbour crane	12/2014	12/2015	2.70	Completed
AT016	Land recovery Part 2	AT	Wien	Freight handling capacity bottleneck. Extension of the port's container handling capacities through land recovery and the construction of a new quay wall in order to optimise the areas of operation.	09/2013	12/2015	6.57	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
AT017	Expansion container terminal construction Stage 1	AT	Wien	Freight handling capacity bottleneck. Extension of the port's container handling capacities through Container terminal expansion.	01/2013	12/2017	5.11	On-going
BG001	Technical Assistance for waste management in Bulgarian public transport ports of national importance	BG	Vidin, Lom, Ruse	Objectives: To identify needs of investments in reception and processing facilities for ship generated waste; To standardize procedures and reduce administrative burden and costs for documentation, control and monitoring of activities of waste management in the Bulgarian public transport ports;	03/2013	10/2015	N/A	Completed
BG002	Design and Implementation of Geographic Information System (GIS) for Port Infrastructure Management	BG	Vidin, Lom, Ruse	The project is financed by European Regional Development Fund and the national budget through the Operational Programme on Transport 2007–2013 under Priority Axis "Technical Assistance"	04/2011	12/2013	N/A	Completed
BG003	Dredging works of the basin of port of Lom	BG	Lom	Dredging in the aquatory of port of Lom	11/2014	01/2015	0.10	Completed
BG004	Concession of Port of Oryahovo	BG	Lom	Port road network repair, repair of the port fence, maintenance of the existing infrastructure	06/2008	06/2033	1.20	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
BG005	Concession of Port of Lom	BG	Lom	Rehabilitation of crane rails, rehabilitation of the power electrical network, building of a fence, rehabilitation of administrative and technical buildings and facilities, repair and maintenance of machinery and equipment, new manoeuvring ship, video surveillance system, certification as per ISO 9001:2008 requirements, etc.	05/2013	05/2048	11.20	On-going
BG006	Rehabilitation, reconstruction and modernization of the infrastructure and metal quay wall between 4-th and 6-th berth place	BG	Lom	Rehabilitation, reconstruction and modernization of the infrastructure and metal quay wall between 4-th and 6-th berth place	unknown	unknown	2.00	Planned
BG007	Rehabilitation, reconstruction and modernization of the western quay between 7 and 9 berth places	BG	Lom	Rehabilitation, reconstruction and modernization of the western quay between 7 and 9 berth places	unknown	unknown	2.50	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
BG008	Rehabilitation, reconstruction and modernization of the eastern quay between 11 and 13 berth places	BG	Lom	Rehabilitation, reconstruction and modernization of the eastern quay between 11 and 13 berth places	unknown	unknown	5.00	Planned
BG009	Building of new quay wall at the eastern quay, 14-th berth	BG	Lom	Building of new quay wall at the eastern quay, 14-th berth	unknown	unknown	9.00	Planned
BG010	Prevention of Lom city against floods	BG	Lom	River levels above 815 cm cause serious damage and stopping of the work on the eastern quay of Port of Lom. Prevention is foreseen by raising the level of the terminal and total reconstruction of the port infrastructure.	unknown	unknown	1.10	Planned
BG011	Building of an intermodal terminal and handling of ro-ro ships	BG	Lom	New terminals planned in the Master plan for Port of Lom	unknown	unknown	6.00	Planned
BG012	Technical help for building of intermodal terminal in North-central region in Bulgaria – Ruse	BG	Ruse	Technical help for preparation activities for construction of the Intermodal terminal: approved conceptual design, detailed development plan and procedures for preservation of the cultural heritage and environment	11/2012	01/2015	2.60	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
BG013	Concession of Port terminal Svishtov	BG	Ruse	Rehabilitation of storages, building of silos, repair of cranes, investment in machinery and equipment, administrative and technical buildings rehabilitation and maintenance, widening of berth 8, building of wastewater treatment facility, etc.	04/2007	04/2038	9.80	On-going
BG014	Concession of Port terminal Somovit	BG	Ruse	Rehabilitation and development of storage areas, new silos construction, maintenance and repair of the existing port infrastructure.	08/2009	08/2031	3.30	On-going
BG015	Concession of Ferryboat terminal Nikopol	BG	Ruse	Rehabilitation of the power electrical network, maintenance of the existing infrastructure	10/2013	10/2048	0.03	On-going
BG016	Rehabilitation and maintenance of Port Ruse-east	BG	Ruse	Rehabilitation and maintenance of open and covered storage spaces, quay walls, water supply network, port railway network repair, port road network maintenance, etc.	unknown	unknown	N/A	Planned
BG017	Concession of Port terminal Ruse-east	BG	Ruse	Concession contract foresees maintenance, reconstruction and rehabilitation of the terminal, as well as new infrastructure if needed	unknown	unknown	N/A	Planned
BG018	Development of specialised intermodal terminal in Port Ruse-east	BG	Ruse	Strategic plans of the operator include the option for development of specialised area in the port for handling intermodal cargo from/ to ships, railway and road. There is handling cargo in containers and trailers currently.	unknown	unknown	N/A	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
BG019	Rehabilitation and maintenance of Port Ruse-west	BG	Ruse	Rehabilitation and maintenance of open and covered storage spaces, quay walls, water supply network, port railway network repair, port road network maintenance, etc.	unknown	unknown	N/A	Planned
BG020	Concession of Port terminal Ruse-west	BG	Ruse	Concession contract foresees maintenance, reconstruction and rehabilitation of the terminal, as well as new infrastructure if needed	unknown	unknown	N/A	Planned
BG021	Concession of Port terminal Vidin North and Ferryboat complex Vidin	BG	Vidin	Construction of three new berth places for bulk cargo. One new crane was put into exploitation there, and one auto weighing scale. New concrete pavements made.	10/2010	10/2040	8.00	On-going
BG022	Intermodal terminal development and new terminal for liquid fuel on new berths	BG	Vidin	The current concessionaire has an ambitious plans for future development, including attraction of intermodal cargo and new fuel terminal.	unknown	unknown	N/A	Planned
BG023	Development of Port Community Systems	BG	Ruse	Feasibility study and development of system along the two corridors, crossing the territory of Bulgaria (Rhine - Danube and Orient/East-Mediterranean), for management, optimization and automation of logistic processes and multimodal transport /Port Community Systems/. Carry out feasibility study and create conditions to facilitate the multimodal	01/2016	12/2019	5.11	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				transport along the two corridors in the scope: 1. sea - road and rail transport; 2. river - road and rail transport; 3. sea - road and rail transport - river				
BG024	Updating the Master Plans of Danube River ports	BG	Ruse	Preparation of Master Plans for ports along two corridors. Performance of environmental impact assessment. Construction of waste reception facilities for solid and liquid waste. Updating the Master Plans for ports along the two corridors, crossing the territory of Bulgaria (Rhine - Danube and Orient/East-Mediterranean), including performance of environmental impact assessment and construction of waste reception facilities for solid and liquid waste.	01/2016	12/2018	4.09	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
BG025	Construction of LNG terminal in Ruse with fuelling facilities for future LNG vessels	BG	Ruse	Terminal for storage of LNG equipped with a truck fuelling station and a pontoon to be used for future fuelling of inland vessels Capacity: 1.000m3 LNG	01/2014	12/2015	N/A	Completed
HR001	Infrastructure upgrading and development of terminals and supporting facilities in port of Slavonski Brod	HR	Slavonski Brod	Upgrade of basic port infrastructure and construction of supporting facilities in the port. The Action will include the construction of vertical bank and placing two quays (quay 4, quay 5) and placing handling equipment (cranes), building of weigh house, container and Ro-La terminal, and construction of supporting facilities at minimum size allowing the start of operation of terminals	01/2015	12/2018	22.90	On-going
HR002	Technical Assistance for reconstruction of the Port of Vukovar-New port East	HR	Vukovar	No bottleneck, new port constructions. Development of the main design with the technical specifications, drawings and bill of quantities for reconstruction of the Port of Vukovar, based on the existing conceptual design and environmental, socioeconomic, geographical and geodetic surveys and to prepare and submit to the relevant national authority all required documentation according to national legislation necessary for obtaining the building permit, including	unknown	unknown	1.60	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				all consequent modifications if necessary.				
HR003	Reconstruction of the Port of Vukovar - New port East	HR	Vukovar	No bottleneck, new port constructions. The New port of Vukovar project encompasses the construction of infrastructural port facilities, vertical bank, road and railway, communal infrastructure, port loading and unloading equipment as well as construction of administration building.	unknown	unknown	24.17	Planned
HR004	Passenger dock	HR	Slavonski Brod	The passenger Dock consists of pontoon for berthing ships. Tanker barge will be reconstructed for this purpose.	01/2015	12/2019	2.00	On-going
HR005	Dangerous cargo terminal	HR	Slavonski Brod	Waste Reception and Bunkering terminal, provides refuelling fuel for ships and removal of waste from the ships in an environmentally friendly way. Consists of dock with a length of 90 meters with two fuel tank capacity of	01/2015	12/2020	7.00	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				1000m3 and other equipment for waste disposal.				
HU002	Port infrastructure developement	HU	Budapest (Csepel)	Project for reparation, rebuilt and development the infrastructure of Freeport of Budapest.	01/2014	12/2018	11.00	On-going
HU003	Master Plan and feasibility study for the development of the TEN-T ports, including Komarom Port	HU	Komarom	Located on the Hungarian stretch of the Danube on a pre-identified section of the Rhine - Danube Corridor, the Action aims to improve basic ports infrastructures, provide access to the inland ports and foster their connections with road and inland waterway networks. It is part of a global project to develop and upgrade the overall Rhine - Danube Corridor to reach stable navigation throughout the year. It encompasses four Activities: project management, master plan development, feasibility study and case studies. The outcome of the studies will lay the ground for future port development by setting strategic directions and development priorities after 2020.	08/2016	04/2018	1.05	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
HU004	KÖZOP-4.7.0-15-2015-0018 Purchase of equipment for Port Danube Ltd.'s range of services to be expanded	HU	Komarom	This development was justified by the formerly low utilization of the potential of river navigation. IWW capacity of the Danube is up to 10-20% of the Rhine, however, this mode of transport is considerably more favourable than almost any parameter in terms of road or airways. Therefore, project aimed this mode of transport to be better exploited by using an efficient, intermodal terminal (combining multiple tools and modes) linking the Danube waterway freight transport with rail and road, reducing road congestion and load. Water transport ensures the efficient transfer of goods, thus, in this project, Port Danube Ltd. set up two tools to increase the efficiency of moving goods. Firstly, a unique conveyor belt tailored to special, local needs, which is primarily suitable for moving bulk goods e.g. cereals, fertilizers, pellets etc. The other equipment is a Bobcat S570 loader with spoon. This is a well-known loader, which is extremely manoeuvrable and efficient. The machine weighing only 2.9 tons being able to hold 1 ton. The goal of investing and introducing the two equipment was to increase the efficiency of loading and unloading, enhancing the competitiveness and economy of watery freight.	03/2015	06/2015	0.08	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
HU005	KÖZOP-4.1.0-13-2013-0003 Implementation of enhancements to increase intermodal capacity at the Port of Komarom	HU	Komarom	The project contributed to a long-term goal of the port, i.e. to become a National Public Port. To achieve this goal, works have begun in Komarom, where modernization of the freight terminal and the modernization of trucks and transhipment of vessels are being implemented. In the framework of the project, Port Danube Ltd. makes the shore suitable for quick carrying of industrial scale shifts, and a pavement built on the high side by means of road transport to temporary storage of materials (containers) on the ground. By modernizing the shipyard, water transport significantly relieves long-distance road transport.	03/2015	06/2015	2.50	Completed
HU006	Upgrading the railway link to Budapest inland free port	HU	Budapest (Csepel)	The free port of Budapest, the biggest inland port in Hungary, handling around 3.5 million tons of freight per year. The proposed Action will deliver the preparatory studies to upgrade the railway connection of the port to the national grid. It is located on the Orient/East-Med and the Rhine - Danube Corridors and is part of a global project that aims to improve the 1.5 km long railway link connecting the port to these Corridors. The Action consists of four activities: project management, preparation of feasibility study and cost-benefit analysis, design for the	01/2016	02/2018	0.99	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				construction of a provisional bridge, and permit designs for the upgrading of the port railway node. The Action will have a positive impact on congestion, interoperability, service quality, safety and security.				
HU007	KÖZOP-4.7.0-15-2015-0045 Development of basic infrastructure of MAHART Hungarian Shipping Co. Ltd. in the Freeport of Budapest	HU	Budapest (Csepel)	The main objective of the project was to increase the availability of services provided in the Freeport. MAHART planned to establish a point of entry and exit at the meeting point of public and private areas at the port. The entry and exit points are mainly for registering vehicles, and if necessary, controlling and loading heavy goods vehicles. Through the development of the port infrastructure, 2950 m2 of land was provided with a solid enclosure. With the implementation of the investment, the level of parking and related services has been increased and improved, resulting in a better access to the use of port services. By establishing the facility, a safer, more controlled management of internal traffic became possible.	06/2015	11/2015	0.23	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
HU008	KÖZOP-4.5.0-09-11-2012-0003 Implementation of the 1st Phase of the intermodal and capacity-building development of the Freeport of Budapest	HU	Budapest (Csepel)	Project contained: - modernization of exterior and Mirelite railways; - development of north-western corner of the 2nd pool; - construction of small open loaders; - illumination of the 5th extraction track; - north connecting road – north; - north connecting road – south and roundabout; - north-south connecting road; - construction of parking lot no. 4. - reconstruction of tracks and pavement at the Grain warehouse; - reconstruction of freight trains and pavement	01/2013	12/2015	10.66	Completed
HU009	IKOP-2.1.0-15-2016-00025 MAHART Mobile Flood Dam	HU	Budapest (Csepel)	Strategic goal is to ensure the flood protection of the dynamic and developing Freeport with a central role in the Danube region. The main objective of the project is to ensure product protection in the port by realizing the investment. Operational objective is periodic flood risk times recurring regularly recently, to represent a minimum risk and shutdown for BSZL and its lessees. Project includes the construction of mobile gates on the flood protection line, based on the height of the quay, with two types of artwork geometry for the related filling and barrier construction	09/2016	10/2018	4.48	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				work. After implementation, a multi-use structure will be completed protecting against water, largely decomposed beyond the protection period. An essential aspect of its overhaul is the need to place flood control tasks on the designability of deployability more emphasis. Accordingly, the planned height of the flood protection line on the section to be harvested is 103,93 a.s.l. The project also includes the construction of a building for the storage of barriers, which are halls covered and enclosed, which do not require temperament, totalling 600 m2 floor area.				
RO001	Modernization of port infrastructure in the Port of Drobeta Turnu Severin	RO	Drobeta Turnu Severin	The works to be completed within the investment project to modernize the port consist in hydrotechnical construction works and shall result in the rehabilitation of the vertical and stone-lined quays in the commercial and passenger ports.	01/2018	12/2020	20.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO002	New trimodal terminal in port of Drobeta - Turnu-Severin (Terminal trimodal nou in portul Drobeta Turnu Severin)	RO	Drobeta Turnu Severin	1.Increasing the capacity of loading and unloading goods and passenger traffic capacity while enhancing and upgrading service offerings. Project will solve simultaneously unlocking access roads and rail of port ensuring effective links with European corridors 4 to 7. 2. Connection of the industrial sector to the major transport corridors 3. Road connection with a bridge 4. Rail connection 5. RO-LA ramp 6. RO-RO ramp 7.Providing depths at berths by utilising a dredging complex.	01/2017	12/2019	71.00	On-going
RO003	High-Performance Green Port Giurgiu 2012-EU-18089-S	RO	Giurgiu	The main objective was to transform Giurgiu port into the first efficient green port on the Danube that plays the role of a leading high-performance tri-modal logistics hub in the area. It was envisaged that this is to be achieved by relying on a dedicated energy-efficient and innovative port development concept and a series of environmental protection and restoration measures. The project had 3 main actions: 1. Analyse the situation in Giurgiu Port by elaborating a technical and operational analysis, a market analysis and an environmental analysis 2. Develop concepts for innovative	01/2013	12/2015	0.80	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				technology at the port by undertaking a series of studies meant to lay out the steps needed to transform the current location into a highly performant green port 3. Design the new green port in Giurgiu and define its business plan.				

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO004	High-Performance Green Port Giurgiu (Stage 2 - Construction) 2014-RO-TMC-0313-W	RO	Giurgiu	The proposed Action is the implementation of the Study "High Performance Green Port Giurgiu – 2012-EU-18089-S" funded under the TEN-T program. The Study which will be finalized in August 2015 represents stage 1 of the transformation of Giurgiu Port into a High Performance Green Port and provides all necessary preparatory work for the realization of the port development project. Stage 2 will deploy the infrastructure as a "works project". Relying on the experience of the 1st stage project, the Coordinator of the Action will be the private company which will build and operate the intermodal terminal and its connections to the railway, waterway and road networks. The Municipality will be responsible for land preparation operations needed for the construction of the intermodal terminal. Additionally, it will construct one railway level crossing and eco-restore the area around the intermodal terminal. The Free Zone Administration will rehabilitate the road network and a section of the old quay within the Free Zone Port.	05/2015	08/2018	15.59	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO005	Modernization of port infrastructure in the Port of Giurgiu	RO	Giurgiu	• Reinforcement of stone-lined wharves in Veriga Basin (L = 350 m) • Reinforcement of the mole in Veriga Basin (L = 90 m) • Modernization of the stone-lined wharves in Ramadan Basin (L = 895 m)	12/2017	12/2019	5.00	Planned
RO006	Giurgiu port - Development of a multimodal platform and hinterland connections	RO	Giurgiu	Increasing the capacity of loading and unloading goods and passenger traffic capacity while enhancing and upgrading service offerings. Project will solve simultaneously unlocking access roads and rail of port ensuring effective links with European corridors 5 to 7. The industrial sector area, 38.0 ha, will include the following: 1. A new harbour basin (water surface) in the area of 15.0 ha 2. Connection of the industrial sector to the utilities networks (electricity, water and sanitation) 3. Connection of the industrial sector to the major transport corridors 4. Road connection - 5 km to Giurgiu West belt 5. Rail connection - 5 km to Giurgiu CF belt 6. RO-LA ramp 7. In order to achieve the project objectives it is necessary land acquisition - an area of 38.0 ha it is required.	12/2018	12/2022	103.53	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				8. Recalibration works in Veriga Basin and Plantelor Canal 9. Providing depths at berths by utilising a dredging complex.				
RO007	Infrastructure Works in Port of Galati: Modernisation of Berth 32 / GRAIN TERMINAL IN PORT OF GALATI - PIER 32	RO	Galati	2. Develop concepts for innovative technology at the port by undertaking a series of studies meant to lay out the steps needed to transform the current location into a highly performant green port	01/2017	12/2020	6.60	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO008	Infrastructure Works in Port of Galati: Modernisation of Berth 31 / GRAIN TERMINAL IN PORT OF GALATI - PIER 31	RO	Galati	3. Design the new green port in Giurgiu and define its business plan.	05/2011	03/2018	9.28	On-going
RO009	Galati multimodal platform Stage I - Upgrade of the waterside infrastructure	RO	Galati	The Danube is Europe's second longest river. Located at the Port of Galati on a pre-identified section along the Rhine - Danube corridor, the Action aims to improve the port's road and inland waterway connections, upgrade the port basic infrastructure and provide new waterside terminal facilities. It is part of a global project to develop and upgrade the overall Rhine - Danube corridor to reach stable navigation conditions throughout the year. The Action encompasses 7 Activities covering preparatory studies, waterside infrastructure development, which includes an extension of the quay wall into the port basin, and the upgrading of the port's connection to the road network.	08/2016	12/2020	25.62	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO010	Ro-Ro terminal	RO	Galati	The project will cover the following objectives: • Upgrade of basic port infrastructure and construction of supporting facilities in the port • establishment of intermodal facilities	01/2018	12/2019	1.03	Planned
RO011	Reducing infrastructure clogging in the Maritime Danube ports	RO	Galati	Analysis of the current situation related to the colmation process within Maritime Danube Sector area and elaborating an Action Plan in order to decrease this process [including by port infrastructure works / investments] in order to offer better operating and sailing conditions for sea-going and inland vessels.	01/2016	12/2020	2.50	On-going
RO012	Strategic Development Programme of Galati Port	RO	Galati	Analysis of the current situation and elaborating a Strategic Development Programme related to Galati Port in order to generally increase the attractiveness of the port area and the facilities offered to the customers.	11/2014	12/2015	0.29	Completed
RO013	Galati multimodal platform - Stage II - Upgrade of the infrastructure for land acces to the port of Galati	RO	Galati	The proposed action involves modernization and rehabilitation works which shall be located in the South-East Region of Romania, "Bazinul Nou" area of the port of Galati: • Upgrading the road access between the port and the TEN-T road network, including the construction of a bridge above the railway lines exiting the shunting yard and a roundabout; • Relocation of a railway line to enable	unknown	unknown	10.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				free access from the shunting yard to the other port areas / port operators located downstream of "Bazinul Nou" port area The proposed action involves modernization and rehabilitation works which shall be located in the South-East Region of Romania, "Bazinul Nou" area of the port of Galati: • Upgrading the road access between the port and the TEN-T road network, including the construction of a bridge above the railway lines exiting the shunting yard and a roundabout; • Relocation of a railway line to enable free access from the shunting yard to the other port areas / port operators located downstream of "Bazinul Nou" port area				
RO014	Galati multimodal platform - Stage III – Development of the multimodal platform for operations and In-Out Gate	RO	Galati	Development of the Multimodal platform for operations and In-Out Gate : multimodal platform for operations, storage and stacking areas, internal roads, internal railway lines, fixed and mobile facilities for operations, Terminal Operating System	unknown	unknown	45.45	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO015	Development of Braila Port	RO	Braila	Analysis of the current situation and elaborating a Strategic Development Programme related to Braila Port in order to generally increase the attractiveness of the port area, to support further investments [including in infra- and super-structure] and to add more facilities offered to the customers.	12/2016	12/2020	0.72	On-going
RO016	Development of Tulcea Port[stage1+stage 2]	RO	Tulcea	Analysis of the current situation and elaborating a Strategic Development Programme related to Tulcea Port in order to generally increase the attractiveness of the port area and implementing further identified investments [including in infra- and super-structure], planned to add more facilities offered to the customers.	12/2016	12/2020	41.00	On-going
RS001	Construction of the new Port of Belgrade	RS	Belgrade	New port construction. Current port is now in the urban environment. Appropriate documentation for establishing the port area, construction and development of a new Belgrade port needs to be elaborated and adopted according to national legislation. Construction of port facilities, vertical quay, road, railway and communal infrastructure.	unknown	unknown	343.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
SK001	Modernization of infrastructure in cargo port BA and completion of bollards in cargo port	SK	Bratislava	No bottleneck, improvement measure. Within the last 20 years the port faces lack of the investments in the modernization of port infrastructure. Due to this fact the port infrastructure is in a very bad and unsatisfactory technical condition not meeting the safety requirements. It is therefore necessary to modernize the port infrastructure so that the public port of Bratislava meet the current requirements for safe landing and berthing of ships. The scope of works is defined by the Feasibility study for Modernization of public port of Bratislava.	12/2019	12/2023	63.17	Planned
SK002	Modernization and completion of the port quays and hard standings	SK	Bratislava	No bottleneck, improvement measure. Due to the planned relocation and transhipment of goods and bulk materials from the Winter port area to the pool Pálenisko hard standings need to be built. At the same time, it is necessary to complete the port quays serving for loading and unloading of goods and materials. The scope of works is defined by the Feasibility study for Modernization of public port of Bratislava	12/2019	12/2023	40.44	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
SK003	Passenger port - waterfront Eurovea in Port of Bratislava	SK	Bratislava	No bottleneck, improvement measure. The need to implement this investment project is based on development concept of public ports approved by Government Resolution no. 846/2010, while considering using this port for the development of public passenger shipping, as this area is located near the city centre of Bratislava.	05/2013	12/2023	7.00	On-going
SK004	Master plan and feasibility study for the Komarno port	SK	Komárno	The Danube is the second-longest river in Europe. Komarno is an inland waterway core port located on a pre-identified section of the Rhine - Danube Core Network Corridor. The proposed Action entails preparing a master plan and a feasibility study for the future expansion and modernisation of the port. Both will serve as a decision-making tool for the selection of the best options for future expansion and modernisation. In the long term, the Action will contribute to increase the port's intermodal capacity, improve the services, enhance interoperability, support modal shift, increase safety, decongest the city of Komarno, and reduce CO2 emissions, noise and air pollution.	09/2016	06/2019	0.67	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
SK005	Feasibility study for the Modernization of public port of Bratislava	SK	Bratislava	The Feasibility study needs to be understood as a first step to identify the extend of the works necessary to be implemented in the second stage for the whole Modernization of the public port of Bratislava. It also includes CBA and EIA in order to facilitate the smooth implementation of works.	12/2017	01/2019	2.50	Planned
SK006	Port Safety Protection	SK	Bratislava	Project is aimed at ensuring physical, environmental and fire protection and safety of the ports in order to reduce the reaction time in case of accidents on the waterway, in the basins or in the land areas of the ports. In a first phase the studies will be prepared in order to facilitate the physical implementation of the works in the second phase.	11/2017	04/2023	22.60	Planned
SK007	Waterway public transport - feasibility study	SK	Bratislava	The aim of the project is to settle up and operate a fast service shipping transportation in the form of commuting public traffic on the river Danube between Bratislava city centre, its municipalities and urban areas. The project focuses on the feasibility of the public transport on the waterway while taking into account possibility of the LNG vessels to be used in this case.	09/2017	08/2018	0.42	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
SK008	Waterway public transport - works	SK	Bratislava	The aim of the project is to settle up and operate a fast service shipping transportation in the form of commuting public traffic on the river Danube between Bratislava city centre, its municipalities and urban areas. The project focuses on the feasibility of the public transport on the waterway while taking into account possibility of the LNG vessels to be used in this case.	08/2018	06/2020	15.00	Planned
SK009	Construction of the LNG Terminal in public port of Bratislava	SK	Bratislava	Project is aimed at ensuring construction of the LNG terminal incl. bunkering station for LNG transfer on the Danube river and bunkering options for vessels. The terminal will also serve for the other transport modes as a fuel station.	11/2017	04/2020	12.00	Planned
SK010	Passenger port - Phase 2	SK	Bratislava	The promenade in this section is divided into three levels. The first level of the promenade is located at the level of Bratislava's pedestrian zone. The second level of the promenade is a new level at the Danube waterfront's edge, the third level of the promenade is at the water level.	03/2022	09/2025	88.37	Planned
SK011	Passenger port - Phase 3	SK	Bratislava	The goal of this part of the project is to build a floating promenade for the public, similar to the first section, that facilitates closer and safer access to the Danube. The promenade will be used for rest and sports activities for the public and for	09/2025	10/2028	14.32	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				short-term berthing of small sporting vessels and their long-term berthing between the pontoons and the shore as well as berthing of large passenger and cabin vessels.				
SK012	Port Safety Protection - Phase 2	SK	Bratislava	Physical implementation of the works which were defined in first phase of the project.	01/2019	12/2023	22.10	Planned
SK013	Construction of the LNG Terminal in public port of Bratislava - Phase 2	SK	Bratislava	Project is aimed at ensuring construction of the LNG terminal incl. bunkering station for LNG transfer on the Danube river and bunkering options for vessels. The terminal will also serve for the other transport modes as a fuel station.	01/2019	06/2021	11.30	Planned
SK014	Modernisation of Komarno public port	SK	Komárno	The goal of the Modernisation of Komárno Public Port project is to restore its place in the national economy and within the international TEN-T network corridor. Given that the current location of the port is in close proximity to the residential and historical core of the city of Komárno, there is a long-term need to transfer cargo transport to a new location.	01/2020	01/2027	122.12	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO017	Road bridge at km 0+540 of the Danube–Black Sea Canal and the works related to the road and access infrastructure for the Port of Constanța	RO	Port of Constanta	The works are related to the building of a bridge over the Danube–Black Sea Canal as well as to the various access roads, ramps and passageways related to the bridge. • Building of a bridge over the Danube–Black Sea Canal • Various access roads, ramps and passageways related to the bridge	01/2010	12/2014	45.69	Completed
RO018	Development of the railways capacity in the river-maritime area of the Port of Constanța	RO	Port of Constanta	The project aims to build a complex railways system (railroad yard) in the river-maritime sector to supply optimal and uniform services for current and future port operators. The railroad yard station shall have 3 tracks for the reception of trains from the Romanian railways network, 12 tracks for the handling of carriages, their separation for the port operators and 2 tracks for the review and repair of the carriages.	01/2012	04/2016	21.79	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO019	Masterplan of the Port Constantza	RO	Port of Constanta	The objective of this project is the carrying out of a medium and long term port strategic planning (until the year 2040) under the provision of a continuous port development and efficient use of the existing resources and infrastructure, directed towards the real needs of the market, deemed as being a priority for Constantza Port Administration. The new Master Plan will stand as the basis for the Port of Constantza development strategy within the period 2012-2040, as well as for the decisions regarding the optimum planning of investments in the port, in a global and harmonized vision to approach the port's projects and its development areas in such a way that the Port of Constantza should be able to equally serve the national needs and those of its hinterland within the context of high efficiency, competition with other ports and globalization.	01/2013	02/2014	1.19	Completed

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO020	Modernisation of port infrastructure, by providing deeper approach channels and basins and by increasing the navigation safety in the port of Constantza	RO	Port of Constanta	In order to ensure safe navigation conditions for ships in the port of Constantza, N.C. M.P.A. S.A. Constantza has promoted an investment regarding: - Dredging works for the projected depth of port basins and channels in the port of Constantza; - Increasing the depth of the "work port" and its access fairway, located in the Constantza South Port; - Dredging at berths.	01/2016	12/2017	47.30	On-going
RO021	Implementation of Deep Water Specialized Berth (Berth 80)	RO	Port of Constanta	• Boost the competitiveness of the Port and increasing its capacity for dry bulk (grain) handling • Establish the basis for increasing cargo flow and for developing the current position of Constanta Port as an export hub for cereals • Maximum utilization of existing port infrastructures • Avoid under-utilization of coal and ore terminal as a result of increasing ample capacities for this commodity in future	01/2015	12/2017	4.80	On-going
RO022	RoRo and Car Terminal in Constanta South Port - Agigea (Pier IIIS) (S3)	RO	Port of Constanta	The three stages will cover the following objectives: • Establishment of a competitive RoRo and Car Terminal in the Port • Provide the Port with modern infrastructures and facilities • Cover the additional car export cargo forecasted in short, medium and long term	12/2017	12/2036	290.30	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				• Increase the possibility to attract new commodities (e.g. RoRo ferry traffic) • Establish the basis for additional traffic corridors to the Caucasian Region and Central Asia in a long term perspective (old silk road)				
RO023	Implementation of Traffic Management System and Port Community System (S4)	RO	Port of Constanta	The objectives of the traffic management system as part of a port operating system are: • Truck movements shall be pre-planned, coordinated and monitored among terminals; • Port passage procedures and traffic flow shall be improved; • Road congestion inside the Port and outside shall be minimized; • Receiving and holding capacity at the terminals corresponds with peak demand; • Savings in inland transport cost; • Safety, security and environmental quality standards shall be applied; The objective of the Port Community System is to unify and standardize the operational processes and administrative requirements of the port clients (freight forwarder, terminal and shipping operators)	01/2018	12/2019	2.30	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO024	Doubling the railway in the Agigea Lock - Constanta Ferry Boat [...] (S6)	RO	Port of Constanta	The project will result in reduced waiting times of the trains. It is to be noted that the doubling of the access railway line at the Constanta Ferry-Boat station has been analysed within the Feasibility Study "Development of the railway capacity in Constanta South Agigea Port" (Object I.c.2"). However, in the above mentioned study the works were not included in Phase I of the works but being proposed to be implemented "as soon as all the financing conditions will be met".	01/2018	12/2018	5.00	Planned
RO025	Railway Development at Pier II (S7)	RO	Port of Constanta	The project will lead to an increased efficiency of the loading-unloading operations and will ensure the absorption of the container traffic on railway lines which grew more than expected and according to the perspective traffic data three more loading-unloading rail lines are needed to be built. Within the Feasibility Study "Development of rail capacity in Constanta Sud Agigea Port" development of the rail lines group of container terminal on Pier IIs was analysed (Object II.B.1). In the above mentioned study the works were not included in Phase 1 of the project but completion being proposed to be implemented when necessary.	01/2019	12/2019	3.15	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO026	Expansion of road between Gates 7 and the junction with "Road bridge at km 0+540 of the Danube Black Sea Canal" […] (S8)	RO	Port of Constanta	The existing road connecting the Bypass of the Constanta city and the Gates no.7 and 9, has only two traffic lanes and has already reached its capacity limit. In addition, the road is in a poor technical condition, being insufficiently designed for heavy traffic from the Constanta North Port which runs mostly through Gate 7.	06/2017	12/2018	19.67	On-going
RO027	Expansion to 4 lanes of the road between Gate no.10 bis and Gate no.10 (S10)	RO	Port of Constanta	The main objective of the project is to ensure a continuous traffic flow of the four lanes road inside Constanta South Port after the access of the trucks through the new access Gate no.10bis to the junction with the actual access point from the Gate no. 10. Considering the fact that after the completion of the projects “Bypass of the Constanta City” and “Road Bridge on Km 0+540 of Danube Black Sea Canal”, each of them having four road lanes up to the access point from Gate no. 10bis and starting from this point, the actual connection road to the Gate 10 has only 2 (two) lanes.	01/2017	01/2019	3.10	On-going

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO028	Truck Holding Area outside Constanta Port	RO	Port of Constanta	After finishing of the road bridge over the Black Sea-Danube Channel almost all traffic approaches the port via the link to the Motorway A4 and considering the large plots of land available at the Motorway the truck holding area should be implemented at this location. The project provides the construction of a large sized truck holding area which will serve the entire Constanta Port (Old, New and South Port). The main objective of the project is to avoid the congestion at the gate areas and at terminal accesses by constructing of a truck holding area and implementation of a truck booking system (refer to Project S4) allowing for a scheduled arrival of the trucks at the terminals. All trucks entering the port has to stop and register at the truck holding area (pre-gate) and after receiving of customs and port control clearance they have to wait for the time window during which they are allowed to enter the port at a certain gate.	01/2019	12/2019	17.70	Planned
RO029	Overpass for new RoRo Terminal in Constanta South Port - Agigea (S12)	RO	Port of Constanta	The main goal of the project is to connect the new Ro-Ro terminal with the port internal road network, thus avoiding traffic congestions.	01/2019	12/2020	27.56	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO030	New-Construction and Expansion of Electric, Gas and Heating Supply Networks (S13)	RO	Port of Constanta	• Be in line with the green port strategies of the European Commission in all the issues regarding the utility networks. • To operate efficient utilities from the technical point of view but also from economic reasons	01/2019	12/2020	29.50	Planned
RO031	New-Construction and Expansion of Water Supply, Sewage and Drainage Networks (S14)	RO	Port of Constanta	• Be in line with the green port strategies of the European Commission in all the issues regarding the utility networks. • To operate efficient utilities from the technical point of view but also from economic reasons • Improve the collection of the rainwater from the surrounding cliff and its soil stabilization	01/2019	12/2021	39.10	Planned
RO032	Development of Quay at the Entrance of the Danube-Black Sea Canal (near work port) (S15)	RO	Port of Constanta	By creating new access to the Constanta South Port – Agigea through Gate 10a, in the proximity to berths DPL2 and DPL1, the development of new port areas, including new berths in this area might become attractive and might arouse interest of new investors in the development of new cargo handling activities close the entrance of the Danube-Black Sea channel.	01/2019	12/2020	17.00	Planned
RO033	Development of Mooring quay adjacent to the connection canal between Berths no. 85-89 (S16)	RO	Port of Constanta	• The target of the project is the increase of the cargo traffic in Constanta Port, by arranging an area located at the linking channel which is currently not developed • Enhance the safety through the linking	01/2019	03/2022	24.00	Planned

Interreg
Danube Transnational Programme
DAPhNE

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				channel • Attract new investors				
RO034	Development of LNG Terminal in Constanta Port (S17)	RO	Port of Constanta	• Establish the position of Constanta Port as hub for the LNG import/transit in the Black Sea region and for the landlocked Danube countries • Decrease the dependency of the national energy supply on Russian natural gas monopoly and transit problems (Ukraine) • Cover the LNG supply for the expected increase of LNG fuelled vessels • Boost the LNG fuel not only for shipping and transportation sector but also for other purposes as energy source for residential, commercial and industrial sectors	01/2019	12/2024	218.00	Planned
RO035	Road Bridge over the link canal and road network in Constanta South Port – River Maritime Area (S18)	RO	Port of Constanta	The main objective of this project is the development of the port infrastructure works which will be concessioned to future port operators to perform superstructure works needed to carry out their own activities, leading to a maritime traffic increase. The area called “The Island” has a higher development potential, which should be turned to good account by carrying out works for infrastructure, main utilities networks and road and rail accesses. The achievement and exploitation of the	01/2019	12/2022	31.64	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				infrastructure works are almost impossible without any direct road connection.				
RO036	Repairing works in the northern and southern breakwater of Constanta Port (S19)	RO	Port of Constanta	• Restore the breakwater and it cross section as close to its design condition in order to cope with future storm events • Secure the inner shelter waters in the Port of Constanta • Maintain the navigational safety conditions	01/2019	12/2020	15.53	Planned
RO037	Barge Terminal at Constanta South Port (2nd Stage)	RO	Port of Constanta	• Expand the barge terminal to avoid existing congestion at the River-Maritime basin. • Cover the forecasted inland waterway traffic demand • Provide new fully dedicated facilities for pushers separated from the barge waiting terminal including respective back up areas	01/2021	12/2024	37.30	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO038	Container Terminal at the Island - 1st Stage (with EPZ)	RO	Port of Constanta	Container Terminal Stage I • New Container Terminal could be operated by several operators sharing the facilities (including the relocation of the existing container terminal at Berths no. 51 and 52). • Increase the competitiveness between operators and end up with the monopoly in Container tariffs in the Port. • Ensure a modern infrastructure, establish the basis for increasing container traffic and attract new container lines. Stage II - III • Cover the forecasted demand in container • Ensure a modern infrastructure in line with the 1st stage of development and increase the capacity of the container terminal. • Guarantee the good position of the port in container traffic of the Black Sea region. Export Processing Zone • Improve the logistic activities within the Port boundaries • Initiates the export processing activities and developing new industrial activities inside the Port borders to strength the location of Constanta Port	01/2020	12/2034	1,052.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				• Generate additional cargo and establish Constanta Port as industrial hub				

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO039	Container Terminal on the artificial Island (without EPZ)	RO	Port of Constanta	The project will comprise the following measures and works for each stage of development : • Land reclamation • New quay construction to enable a new berthing line for container vessels • Rail and road structures (Note: The access structures to the island, namely a new rail bridge and the already projected road bridge over the canal are not included in this project) • Engineering networks (electricity, storm water, potable water and sewage water) • Dredging activities • Embankment protection between development stages	07/2020	12/2034	575.60	Planned
RO040	LNG Bunkering Station at Berth no. 99 (M7)	RO	Port of Constanta	• Cover the potential demand of the LNG as a clean and economical fuel for shipping • Boost LNG as transport fuel, especially for IWT, by means of providing the Port with modern bunker facilities close to the Black Sea – Danube Canal • Fulfil the clean fuel strategy of the EU Commission which requires the installation of LNG refuelling stations (fixed or mobile) in all 139 maritime and inland ports at the Trans European Core Network by 2020-2025	01/2023	03/2026	16.50	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO041	Deepening and Quay Strengthening at Berths no. 31-33 (M8)	RO	Port of Constanta	Increasing the existing water depths in the whole terminal comprising the berthing line from Berth no. 31 up to no. 33 with a total length of 674 m in order to achieve the following objectives: • Improving the infrastructure to accommodate bigger vessels according to the bulk carriers shipping forecast (up to 80,000 dwt, Panamax sized vessel, partially loaded) • Boost the efficiency of the existing port infrastructure and maximize the utilization of the existing infrastructures • Establish the basis for increasing cargo flow and developing the current position of Constanta Port as a hub for the cereal exports	01/2024	12/2027	19.25	Planned
RO042	Development of Railway Capacity in the River-Maritime Area (Berths no. 86-103) - 2nd Stage (M9)	RO	Port of Constanta	Along with the development of the cargo handling and other port related activities in both the river-maritime sector and the area called "Island" the implementation of the Phase II of the works within the project "Development of the railway capacity in the river-maritime sector of the Constanta Port (berths no. 86-103)" shall start.	01/2023	12/2024	7.15	Planned
RO043	Development of Rail Access to the Island (railway bridge in parallel with road bridge)	RO	Port of Constanta	The objective of the project is to create a railway connection to the Island to enable the railway transport.	01/2020	12/2024	26.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO044	Railway Decommissioning Works in Constanta North - New Port	RO	Port of Constanta	• Rededication of areas which are currently occupied by railway infrastructures	01/2019	12/2020	1,497.00	Planned
RO045	Railway Decommissioning Works in Constanta North - Old Port	RO	Port of Constanta	• Rededication of areas which are currently occupied by railway infrastructures.	01/2018	12/2019	1.77	Planned
RO046	Repair Works of Bridges and Overpasses in Constanta South Port - Agigea	RO	Port of Constanta	The main objective for the overpasses repair is to maintain them operational, in safety conditions. Carry out the proposed repairs is beneficial on a short-term and delays in performing the works may result in increased degradations and consequently to an increased cost for the repair works.	01/2018	12/2020	4.30	Planned
RO047	Repair Works of Bridges and Overpasses in Constanta North - New Port	RO	Port of Constanta	The main objective of the proposal for the overpasses repair is to maintain them operational, in safety conditions. Carry out the proposed repairs is beneficial on a short-term and delays in performing the works may result in increased degradations and consequently to an increased cost for the repair works.	01/2018	12/2019	13.39	Planned
RO048	Road repair works in Constanta North – New Port	RO	Port of Constanta	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.	01/2018	12/2019	3.27	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO049	Road repair works in Constanta South Port – River-maritime area	RO	Port of Constanta	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.	01/2018	12/2019	1.31	Planned
RO050	Road repair works in Constanta Old Port	RO	Port of Constanta	The main objective of the project is the repair of the roads mentioned for the purposes of maintaining them functional and of increasing the traffic speed.	01/2018	12/2019	0.50	Planned
RO051	Railway infrastructure works in Constanta North – New Port	RO	Port of Constanta	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.	01/2018	12/2019	14.44	Planned
RO052	Railway Repair Works in Constanta North - Old Port	RO	Port of Constanta	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.	01/2018	12/2019	3.89	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO053	Railway infrastructure works in Constanta South Port- River-Maritime Zone	RO	Port of Constanta	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.	01/2018	12/2019	0.48	Planned
RO054	Railway infrastructure works in Constanta South Port - Agigea	RO	Port of Constanta	• Reconstruction and rehabilitation of the transport infrastructure; • Achieving acceptable levels of operational safety and increased efficiency; • Increasing transport operations efficiency; • A better adaptation to the actual demands concerning cost reduction. This will enable the provision of better services.	01/2018	12/2019	7.40	Planned
RO055	Cereal Terminal on the artificial Island, (with EPZ)	RO	Port of Constanta	Development of port territory area • Building of a new quay • Dredging works • Dry bulk terminal specialized for cereals (operator's responsibility) • Rail and road connections • Utility networks	03/2030	03/2035	119.50	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO056	Cereal Terminal on the artificial Island, (without EPZ)	RO	Port of Constanta	Development of port territory area • Building of a new quay • Dredging works • Dry bulk terminal specialized for cereals (operator's responsibility) • Rail and road connections • Utility networks	03/2030	03/2035	143.50	Planned
RO057	Specialized vessels	RO	Port of Constanta	depollution, collector, PSI, dredging vessels	01/2018	12/2019	34.00	Planned
RO058	Development of Oil Products Platform on the artificial Island in the Port of Constanta	RO	Port of Constanta	Processing and storage area: Surface on the island - 22,38 Ha Surface on the island - 5,88 Ha Maritime Terminal: Surface of 6,50 Ha includes: - quay for loading/unloading liquid and general cargo - western berth (280 m length) specialized for oil tankers up to 40,000 dwt capacity - eastern berth (350 m length) specialized for oil tankers up to 80,000 dwt capacity - dredging will reach 16.00 m draft - reclaiming land from the sea will obtain a surface of 6.50 ha adjacent to the berthing quays	01/2019	12/2021	107.88	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO059	Completion of the North breakwater in the Port of Constanța	RO	Port of Constanta	The completion of the last 1,050 m long sector of the North breakwater, which has not been executed, will have positive effects in terms of safety operations in the Constanta Sea Port which is located on the Black Sea and connected to the Danube via the Danube-Black Sea Canal. • Decreasing the waves in the port to an acceptable level to ensure the safe operation of vessels • Decreasing the destructive effects of the waves on the infrastructure within the port • Smooth access of vessels to the entry into the port • Decreasing the sediments in the waters by guiding the currents further away.	01/2013	02/2015	143.99	Completed
RO060	Photovoltaic park in the Port of Constanta	RO	Port of Constanta	The project will be built in the landfill area and it will have 10 MW installed power generated from 33,000 photovoltaic panels.	unknown	unknown	40.00	Planned
RO061	Wind power park in the Port of Constanta	RO	Port of Constanta	This project is in the direction of research, promotion, development and use of new forms of renewable energy technologies retaining carbon dioxide emissions.	unknown	unknown	60.00	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO062	Feasibility study for railway infrastructure modernisation in Constanta Port	RO	Port of Constanta	The proposed Action contributes to the achievements of the objectives of the global project by preparing for implementation an investment alternative aiming at improving the port's rail connection and the rail hinterland connection on the TEN-T corridor. The study has to determine the way in which the respective objectives of the global project can be met by the proposed Action, in terms of: 1. Full electrification of the line tracks in 25 kV power system; 2. Ensuring interoperability of railway infrastructure through the implementation of technical specification for interoperability and, in particular, the following parameters defined in the TEN-T Regulation: - Axle load - 22.5 t.; - Loading gauge - C; - Length of station lines – min. 740 m; - Nominal track gauge for railway lines – 1,435 mm; - Implementation of ERTMS; - Improving facilities for people with reduced mobility. 3. Increase the design speed as much as feasible whilst ensuring the maximum speed of 100 km/h for freight trains.	06/2018	12/2019	2.81	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
RO063	Upgrade of infrastructure and environmental protection of the Constanta port - PROTECT	RO	Port of Constanta	Upgrading basic port infrastructure, constructing a new on-shore waste collection facility, upgrading the signalling system in the port basin and the fairway, and purchasing five technical vessels. In addition, it foresees elaborating studies for: proper waste management in the oil terminal; generation and distribution of renewable energy in the port area and related public-private partnership potential; and evaluation of the port infrastructure's resilience to climate change. Training on waste handling, pollution and fire prevention is as well foreseen. The Action is embedded in the master plan for the port of Constanta, elaborated with EU funding, but not finalised yet.	07/2016	08/2019	12.69	On-going
RO064	Constanta Green Port	RO	Port of Constanta	Improve the environmental profile of Constanta port by developing a comprehensive and state of the art Port Environmental Management System, while focusing on finding solutions to reduce external costs, prevent damages to health and pollution of air, water and soil. Setting up and executing training of all port employees and the stimulation of the know-how transfer will be encouraged both in-house for the port administration and also between the port administration and private port operators. A multi-annual action	unknown	unknown	4.95	Planned

Daphne ID #	Project name	Country	Port	Short Project Description	Project start date	Project end date	Total costs (M€)	Status (09/2017)
				programme consisting of prioritised measures for the defined areas of action will be elaborated.				